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DESIGN GUIDE FOR

Youth Centers

COMPLETED

48

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Chapter 1 Introduction

- 1-1 A. Purpose of the Design Guide
- 1-1 B. Scope of the Design Guide
- 1-2 C. Use of the Design Guide
- 1-2 D. Primary General Reference Documents

Chapter 2 Initial Planning

- 2-1 A. Objectives of the Project
- 2-1 B. Size of Facility
- 2-1 C. Program of Spaces
 - 2-1 1. Type of Activities
 - 2-2 2. Choice of Activities
- 2-3 D. Adaptation of an Existing Structure
 - 2-3 1. Size of the Existing Structure
 - 2-3 2. Building Configuration
 - 2-3 3. Condition of the Structure
 - 2-3 4. Location on the Base
 - 2-3 5. Image
- 2-4 E. Site Selection
 - 2-4 1. Site Size
 - 2-4 2. Convenience to Related Activities
 - 2-4 3. Convenience to Other Activities
 - 2-4 4. Restricted or Hazardous
 - 2-4 5. Access Considerations
 - 2-4 6. Environmental Conditions

Chapter 3 Design Objectives

- 3-1 A. Architectural Character
- 3-1 B. Internal Circulation
- 3-1 C. Zoning
- 3-1 D. Surveillance
- 3-2 E. Flexibility
- 3-2 F. Durability
- 3-2 G. External Circulation

Chapter 4 General Design Criteria

- 4-1 A. Site Work
 - 4-1 1. Layout and Drainage
 - 4-1 2. Circulation
 - 4-1 3. Landscaping

- 4-1 B. Structure
 - 4-1 1. Special Loads
 - 4-1 2. Materials
 - 4-1 3. Foundation
 - 4-1 4. Framing
- 4-2 C. Building Systems
 - 4-2 1. Energy Budget
 - 4-2 2. Solar Applications
 - 4-3 3. Natural Daylighting
 - 4-3 4. Electrical Systems
 - 4-4 5. HVAC
 - 4-4 6. Acoustics
 - 4-4 7. Plumbing

Chapter 5 Specific Space Criteria

- 5-1 A. Social Spaces
 - 5-1 1. Game Room
 - 5-2 2. Lounges
 - 5-3 3. Snack Facilities
- 5-6 B. Structured Activity Spaces
 - 5-6 1. Meeting Rooms
 - 5-6 2. Project Rooms
 - 5-7 3. Music Rooms
- 5-8 C. Multi-Purpose Space
 - 5-8 1. Multi-Purpose Room
- 5-11 D. Administrative Spaces
 - 5-11 1. Sign-in/Check-out Booth
 - 5-12 2. Staff Offices
- 5-12 E. Support Spaces
 - 5-12 1. Lobby
 - 5-13 2. Storage
 - 5-14 3. Toilet and Changing Rooms
 - 5-15 4. Mechanical Rooms
 - 5-15 5. Corridors and Stairways
- 5-16 F. Outdoor Spaces
 - 5-16 1. Entry Area
 - 5-16 2. Athletic Fields
 - 5-16 3. Playground
 - 5-17 4. Hard Court
 - 5-17 5. Terraces, Courtyards, Patios
 - 5-18 6. Parking and Service Areas

Chapter 6 Project Design

- 6-1 A. Development of Design
 - 6-1 1. Value and Cost
 - 6-1 2. Consideration of Environment
 - 6-1 3. Operating Efficiency
- 6-1 B. Project Cost
 - 6-1 1. Floor Area
 - 6-1 2. Building Massing
 - 6-1 3. Simplified Construction
- 6-2 C. Energy Management
- 6-2 C. Environmental Influences
 - 6-2 1. Adaptation for Climate
 - 6-3 2. Ratio of Indoor to Outdoor Space
- 6-4 D. Relationship of Spaces
 - 6-4 1. Operational Adjacencies
 - 6-5 2. Access Controls
 - 6-5 3. Expansion Potential
- 6-6 E. Organization Principles
- 6-8 F. Illustrative Design Schemes
 - 6-8 1. Scheme A
 - 6-10 2. Scheme B
 - 6-12 3. Scheme C
- 6-3 1. 25 Meter Outdoor Pool Facility
- 6-4 2. 50 Meter Outdoor Pool Facility
- 6-5 3. 25 Meter Indoor Pool Facility
- 6-6 4. 50 Meter Indoor Pool Facility

Chapter 7 Appendices

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A. Purpose of the Design Guide

This guide provides selected general information and some specific design criteria uniquely relevant to the development of facilities which are intended to support MWR youth programs. It is not intended to be a comprehensive "How To Do It" manual or a design regulation.

B. Scope of the Design Guide

This guide applies to new construction and renovation both in the continental United States and overseas. The information provided includes initial planning, design objectives criteria, and practical considerations for project design.

- Chapter 2: Initial Planning. This chapter includes project objectives, optional facility descriptions and programs, and factors for evaluating the adaptation of an existing structure or the selection of a site.
- Chapter 3: Design Objectives. This chapter lists the primary goals of the design.

- Chapter 4: General Design. This chapter includes the general design criteria for the overall building.
- Chapter 5: Specific Space Criteria. This chapter includes descriptions, sizes, and typical arrangements for each functional space that might be included in the facility.
- Chapter 6: Project Design. This chapter includes cost implications, spatial relationships, environmental influences, principles of organization, and sample design schemes to illustrate and encourage innovative design solutions.
- Chapter 7: Appendices. This chapter lists technical documents that establish detailed design standards. Information contained in these documents is not duplicated in this guide, except where specific applications of these standards are included to clarify particular requirements that are important to basic design decisions.

C. Use of the Design Guide

This guide is intended primarily for use by the design agency for the project. However, the information included in this guide, in conjunction with other Air Force criteria and procedures, can also be used by the base programmer, MAJCOMS, and other parties, in the preparation of the construction funding program, such as DD Form 1391 and the Project Book.

D. Primary General Reference Documents

Specific reference documents that establish the technical requirements for various aspects of the design are referenced in the chapters that follow. However, the documents listed below provide the basic standards for the general development of the design.

- DOD 4270.1-M, *Construction Criteria Manual*.
- AFM 86-2, *Standard Facility Requirements*
- AFM 88-15, *Air Force Design Manual - Criteria and Standards for Air Force Construction*.
- AFP 215-34, *Morale, Welfare, and Recreation Objectives*.
- AFR 215-1, *Morale, Welfare, and Recreation (MWR) Programs and Activities*.
- AFR 215-23, *Air Force Youth Activities Program*.
- AFP 215-18, *Air Force Entertainment Programs*.

A. Objectives of the Project

The project is intended to result in a facility that supports the Air Force mission as described in *AFR 215-1*, and that provides and promotes the specific MWR programs and activities for Youth Centers as described in *AFR 215-23*. These facilities enhance the leisure time of youths, age 6 to age 18, by providing equipment, space, and guidance for educational, creative, athletic and social activities.

B. Size of Facility

The overall size for the facility shall not exceed the limits set in *AFM 86-2*. Further, this table of maximum sizes shall be modified by the particular needs of the base, taking into account the following factors:

- ☐ Eligible youth population.
- ☐ Existing base facilities that support youth center activities.

C. Program of Spaces

The selection of both interior and exterior spaces to be included shall satisfy the particular needs and policies of the base, and comply with the overall size and budget limitations for the project.

1. Type of Activities

The number and type of spaces in the building is dependent on the activities offered at the facility. Activities from each of the following categories should be included:

a. Indoor Athletic Activities:

- ☐ basketball
- ☐ indoor soccer
- ☐ volleyball
- ☐ gymnastics, martial arts
- ☐ handball, racquetball
- ☐ broom hockey
- ☐ roller skating

b. Outdoor Athletic Activities:

- ☐ football
- ☐ basketball
- ☐ baseball
- ☐ soccer
- ☐ volleyball
- ☐ field hockey
- ☐ badminton
- ☐ archery, riflery
- ☐ tennis
- ☐ swimming
- ☐ roller skating, skateboarding

c. Educational or Organizational Activities:

- ☐ national youth group meetings (Boy Scouts, Girl Scouts, 4-H Clubs, etc.)
- ☐ local organization meetings (teen council, special interest clubs, etc.)
- ☐ before and after school programs
- ☐ lectures
- ☐ classes
- ☐ educational movies
- ☐ computer labs
- ☐ library
- ☐ summer camps

d. Artistic Activities:

- ☐ dance
- ☐ arts and crafts
- ☐ music
- ☐ dramatics, staged presentations

e. Social Activities:

- ☐ dances, parties
- ☐ carnivals
- ☐ movies
- ☐ arcade games
- ☐ table games
- ☐ snacking
- ☐ television or video cassettes
- ☐ banquets, pot luck suppers, ice cream socials

2. Choice of Activities

In the selection of activities, the following factors shall be considered:

- a. User Needs and Preferences. The activities preferred by users will vary from base to base depending on the demographic profile (ages of participants, cultural background, socio-economic background, number of youth living off-base), location (urban or rural, topography, climate), and the prevailing tastes of the time. In

all cases, a broad spectrum of activities - indoor and outdoor, male-oriented and female-oriented, athletic and artistic - shall be chosen to appeal to all potential participants rather than to a select population.

- b. Climate. The season to season weather patterns will determine the amount of space allotted to outdoor activities, and the type and character of indoor spaces.

Table 2-1: Program of Spaces

	Sizes for Center of EYP† 250-500		Sizes for Center of EYP† 500-1200		Sizes for Center of EYP† 1200-2400		Sizes for Center of EYP† 2400+	
	ft. ²	m ²	ft. ²	m ²	ft. ²	m ²	ft. ²	m ²
Game Room	400	37.2	500	46.4	800	74.3	1400	130.0
□ Storage	25	2.3	50	4.6	75	7.0	100	9.3
Large Lounge	160	14.8	200	18.6	450	41.8	850	79.0
Small Lounge	—	—	—	—	150	13.9	150	13.9
Snack Bar	90	8.4	90	8.4	150	13.9	225	20.9
□ Seating	—	—	150	13.9	200	18.6	300	27.9
□ Vending	30	2.8	30	2.8	40	3.7	50	4.6
□ Food Storage	—	—	25	2.3	100	9.3	125	11.6
Multi-Purpose Room	2710	251.7	4000	371.6	5400 ...	501.7	7000	650.3
□ Storage	within room		75	7.0	200	18.6	300	27.9
Meeting Room	—	—	—	—	225	20.9	300	27.9
Project Rooms	225	20.9	300	27.9	2@300 ..	2@27.9	2@450 ..	2@41.8
□ Closet Storage	10	0.9	20	1.8	2@20 ..	2@1.8	2@20 ...	2@1.8
Music Rooms	—	—	65	6.0	2@65 ..	2@6.0	3@65 ...	3@6.0
Sign-In/Check-Out Desk	90	8.4	100	9.3	100	9.3	150	13.9
Games & Equipment Storage	50	4.6	70	6.5	100	9.3	150	13.9
Staff Offices	—	—	100	9.3	2@100 ..	2@9.3	3@100 ...	3@9.3
Toilet Rooms	2@100	2@9.3	2@130 ...	2@12.1	2@250 ..	2@23.2	2@200 ...	2@18.6
Changing Rooms	—	—	—	—	—	—	2@600 ...	2@55.7
Racquetball Courts	—	—	—	—	—	—	2@800 ...	2@74.3
Net Area	3990	370.6	6035	560.6	9460 ...	878.8	15,735 ..	1461.8
Lobby	50	4.6	100	9.3	150	13.9	200	18.6
□ Coat Closet	10	0.9	25	2.3	40	3.7	45	4.2
Walls and Structure	350	32.5	545	50.6	950	79.0	1260	117.0
Corridors and Stairs	350	32.5	545	50.6	850	79.0	1260	117.0
Gross Area	4750	441.1	7250	673.4	11,340 ..	1053.3	18,500 ..	1718.6
Maintenance and Mechanical	375	32.5	550	51.1	800	74.3	1200	111.5
Outdoor Equipment Storage	50	4.6	75	7.0	125	11.6	200	18.6

- c. **Existing Facilities.** A thorough examination of on-base and locally available youth-oriented activity centers (swimming pools, YMCA's, community recreation programs, gymnasiums, pizza parlors, after-school clubs, amusement centers, libraries, etc.) will prevent the duplication of similar facilities and conserve financial and staffing resources. By coordinating its offerings with these others, the Youth Activities Program can provide the youth with the broadest possible opportunities.
- d. **Preference for Multi-Use Spaces.** Because space is always at a premium, activities which can be accommodated in a multi-use space without costly fixed equipment are encouraged. Multi-use space can also be subdivided with high grade retractable partitions. This offers increased flexibility in scheduling simultaneous activities which require visual and/or acoustical privacy.
- e. **Operating Policies.** The hours of operation and staffing and funding limitations will influence the selection of activities. If staffing is a problem, activities which require constant maintenance or constant surveillance shall be avoided. Unless youth participation is assured, activities which require expensive equipment (photography, film-making, ceramics) or a high degree of organization (certain athletic games) shall be avoided as well.
- f. **Gross and Net Area.** The maximum allowable sizes listed for youth centers in *AFM 86-2* are gross floor areas, including public lobbies, public toilets, circulation corridors and stairs, walls and structure, as well as the net floor areas of the functional spaces, but not including mechanical equipment space. The ratio of total net area to the gross area of these facilities shall approximate 0.75. Table 2-1 provides typical space compositions and areas for various size facilities. The chart should be used as a guide only; specific space compositions and areas shall satisfy the particular project needs.

D. Adaptation of an Existing Structure

An existing structure may be adapted for use as a youth center when and if the following conditions are satisfied:

1. Size of the Existing Structure

The floor area available in the existing structure shall be at least as large as the overall size planned for the project, or be expanded to this size by building an addition on to the original structure.

2. Building Configuration

The form and volume of the existing structure shall be able to house the mix of functional spaces described in Chapter 5, Specific Space Criteria.

3. Condition of the Structure

The existing facility shall be structurally sound and economical to renovate, operate, and maintain.

4. Location on the Base

The facility shall be convenient to playing fields and the residential sections of the base. A facility that satisfies all functional requirements but which is inconvenient to its young users, who often commute by bicycle or on foot, may not be appropriate for conversion.

5. Image

The facility shall present an appropriate public image. If, for example, a residential building is to be converted, the use of landscaping, signage, and minor building changes can assist in presenting an image suitable to the building's new role in the community. This may include enlarging or highlighting the main entrance, adding outdoor lighting and seating, removing shutters or other signs of a former function, enlarging the front walk or stairs to the entrance, etc.

E. Site Selection

If an available existing structure cannot be reasonably or economically adapted or converted to serve as a youth center, a suitable site shall be selected for the new construction. One or more sites may be designated on the base master plan as appropriate for youth program activities. When a choice of sites is available, the following criteria shall be considered:

1. Site Size

The site shall be large enough to accommodate all the components of the youth center facility, taking into account the possibility of further expansion. These components include the building, the playground, athletic fields, hard top surfaces for games and outdoor dances and barbecues, a bike rack, a vehicle drop-off, and the parking lot. Open or landscaped spaces around these components for drives and walks, safe separations between activities, grading transitions between components, and required clearances from adjacent property, shall also be included. For initial planning purposes, the site size can be considered satisfactory if the area of the site is at least the sum of the following:

a. 400 ft.² (37.2 m²) for each parking space. The number of parking spaces shall be at least one for every 100 military personnel on the base, and one for each full time staff member of the facility.

b. The area of each playing field.

c. The gross area of the building.

d. Areas for space around each playing field and the building as estimated by Table 2-2.

2. Convenience to Related Activities

Existing resources such as athletic fields, playgrounds, and bike paths shall be convenient to the site.

3. Convenience to Other Activities

A site convenient to residential areas and schools is required.

4. Restricted or Hazardous

A site near a restricted or hazardous area shall be avoided.

5. Access Considerations

The site shall be accessible by car and by bus, but at a safe distance from major roads in the area. Youths on foot or riding bicycles shall be able to reach the center without crossing busy streets. The site shall not be located where excessive traffic flow through housing or community centers could be a problem. In order to accommodate the occasional sporting event, performance, or teen dance, adjacent over flow parking must be available.

6. Environmental Conditions

a. Topography. The site should be able to accommodate both the building and activity fields without extensive grading and potential damage to existing drainage run-off patterns.

b. Soil Conditions. The soil should be suitable for the support of the facility without extensive foundation structures, rock excavation, or earthwork compaction.

c. Utility Lines. The site shall be readily available to the required utility services, but should be free of infringing rights of way that may limit its use.

Table 2-2: Site Sizes

Area of Playing Field or Gross Area of Building		Area of Surrounding Space to be Added	
ft. ²	m ²	ft. ²	m ²
5000 or Less	460 or Less	7000	650
5000- 7499	460- 699	8000	740
7500- 9999	700- 929	9000	840
10,000-12,499	930-1159	10,000	930
12,500-14,999	1160-1389	11,000	1020
15,000-17,499	1390-1629	12,000	1110
17,500-19,999	1630-1859	13,000	1210
20,000-24,999	1860-2319	14,000	1300
25,000-29,999	2320-2789	15,000	1390
30,000-34,999	2790-3249	16,000	1490
35,000-39,999	3250-3719	17,000	1580
40,000-44,999	3720-4179	18,000	1670
45,000-49,999	4180-4639	19,000	1770
50,000-60,000	4640-5570	20,000	1860
60,000	5570	33% of	
or More	or More	component's area	

A. Architectural Character

The design shall express the focal role the center plays in the lives of youth in the community, and, in a controlled way, appeal to youthful tastes (i.e., look more like a clubhouse than a military installation). Although there is no single mandatory style, the building shall respect the scale and character of the surrounding area. If neighboring buildings are packed fairly close together, the repetition of forms, adherence to a system of proportions, consistent use of coursing, and choice of similar or complementary building materials may contribute to the cohesive image of the community. If the buildings are far apart, the designer has more freedom in developing the external form of the building, but shall still consider the overall character of the base.

Youth centers separated from an immediate context, and thus seen at a distance, shall have a distinctive external form which will create a sense of place and invite use. It is appropriate that geographic conditions, cultural heritage and/or dominant architectural style of the region may influence the character of the facility.

B. Internal Circulation

A clear circulation system shall provide users with direct access from the main entry to all parts of the building, avoiding long corridors and confusing turns. User orientation will be established with visual clues such as preview glimpses into rooms, color coding of activity areas, and/or the careful sequencing of architectural "events." The pattern of circulation shall reflect the functional, acoustical, and territorial separations as outlined under "Zoning." In addition, the internal circulation system shall allow for the potential expansion of the facility.

C. Zoning**1. Territory**

Because the center is used by a wide variety of ages (6-18) and most individual spaces are utilized to some extent by all age groups, it is important for each group to have some area as its home territory.

2. Acoustical Control

Noisy areas such as the multi-purpose room, snack bar, and game room must not infringe on areas of relative calm such as meeting rooms, music rooms, administrative offices, and small lounges designed for reading or quiet conversation.

3. Use

The basic functional groupings are (i) social or drop-in spaces, (ii) structured activity spaces, (iii) the large multi-purpose space, (iv) administrative spaces, and (v) support spaces.

D. Surveillance

Building layout shall allow effective monitoring of the facility at all times with a limited staff. A prominent sign-in/check-out booth (for signing-in upon arrival and checking-out games and athletic equipment) shall be located near the main entrance. It shall be manned by one person and shall have unobstructed views of all entrances and major activity areas (including entrance lobby, game room, multi-purpose room, and possibly the snack bar). The need for privacy in the teen area will be respected; surveillance, if requested, shall be visually unobtrusive. In the larger youth centers, the supervision of the multi-purpose room (and, if feasible, of outdoor activity areas as well) could occur from a separate sports equipment check-out and athletic activities sign-up desk. In all cases, some sort of arrangement must be made for the supervision of outdoor activities.

E. Flexibility

Spaces shall be organized and individually designed to allow for changing user needs and programs. Preference shall be given to spaces which can accommodate a number of different activities, while spaces outfitted with special equipment (e.g., darkrooms, ceramics studios, etc.) shall be held to a minimum. Furniture shall be moveable, stackable (when appropriate), durable, and function well for a number of different seating arrangements. Wall paraphernalia, except for general announcement boards and the snack bar menu board, shall not be mounted permanently, thereby making room for seasonable and temporary repairs. Built-in retractable partitions allow different groups to use a space simultaneously, and are highly recommended for the multi-purpose room, large lounges, and larger structured activity spaces. Lastly, construction materials and structural systems shall permit economical extensions to the building.

F. Durability

Youth centers are subject to extremely hard use, in particular, all surfaces which come into direct contact with youthful users. Hardware and finish materials, signage, and interior furnishings shall be carefully evaluated for their ability to withstand extensive punishment over time. In addition, all surfaces shall be washable, stain-resistant, and easily and inexpensively maintained. In particular, all carpet must conform to criteria in the latest edition of *AFM 88-15*.

G. External Circulation

The external circulation system for youth centers shall consist of an access road, vehicle drop-off, parking lot for staff and visitors, connecting on-site walkways, and, if possible, off-site extensions of existing bike paths, walking trails, and/or sidewalks. A single main public entrance shall receive architectural emphasis, while optional teen and/or athlete entrances shall be secondary. A "back door" leading to outdoor activity areas from within the building is required, but may double as a teen or athlete entrance if surveillance is a problem. A screened entrance for service vehicles is also necessary and shall not interfere with public traffic.

Out-of-doors activity is encouraged. Low walls, fencing and/or landscaping shall be used to control exterior circulation where supervision is difficult. Areas which may require boundaries and general screening include outdoor projects areas, playgrounds for younger children, courtyards, patios and terraces used for teen events, and outdoor performance spaces.

A. Site Work

The design shall comply with the standards listed in Table 7-1, as well as satisfy the following general criteria:

1. Layout and Drainage

Playfields shall be located on areas of the site that best approximate natural level conditions. Positive drainage shall be provided to eliminate ponding on grassy surfaces such as athletic fields and playgrounds, and on paved surfaces, such as the parking lot, the entry area, terraces, patios, courtyards, and the hard court.

2. Circulation

Paths connecting the building entrance, parking lot and playfields may be paved or surfaced with loose materials that minimize injury. Parking lots shall be adjacent and accessible to both the building entrance and exterior playfields where spectator viewing is provided.

3. Landscaping

If possible, outdoor athletic areas shall be situated in proximity to shade trees. The positioning of terraces and patios shall take advantage of natural growth and scenic views. (Tree roots, overhanging branches, and creeping vines, though picturesque, may develop into a maintenance problem and should be removed.) Landscape materials natural to the locality shall be used to the maximum practical extent.

B. Structure

The design shall comply with the standards listed in Tables 7-2 and 7-3, as well as satisfy the following general criteria.

1. Special Loads

The structural system shall be sufficiently rigid to minimize impact-induced vibration caused from athletic activity, such as the dropping of weights and excessive crowd movement.

2. Materials

In spaces subject to high humidity levels, such as the toilet and changing rooms, the structural materials or the material protecting structural elements shall be capable of resisting deterioration caused by condensation. Likewise, in geographical areas subject to adverse climates, industrial atmospheres or coastal exposures, structural materials shall be selected to minimize thermal expansion and to resist corrosion.

3. Foundation

The foundation system of the multi-purpose room shall withstand any excessive loadings associated with long span framing for the superstructure.

4. Framing

The use of pre-engineered structural components for the multi-purpose room is required under current Air Force policy, unless transportation or availability is a problem.

a. The advantages of using pre-engineered components include:

- Low cost and economical construction in a modular uniform application.
- Rapid delivery, in continental United States, and rapid fabrication.
- Integration of trades.
- Overall, a lighter form of construction with lower foundation costs.

b. The disadvantages of using pre-engineered components include:

- Possible problems of supply and delivery overseas.
- Some inflexibility in layout and design; deviation from standard modules and applications is expensive.
- Inadequate corrosion protection, weather tightness and resistance to uplift for extreme climates.
- Constraints on additional loading; equipment suspended from a truss (e.g. basketball backboards, scoreboards, catwalks, stage lighting) may exceed allowable limits.

c. Typical bay dimensions are as follows (Generally a minimum of three bays in length is required for stability):

- Longitudinal spacing: 20'-0", 25'-0" (6.1m, 7.6m)
- Clear span, standard: 40'-0", 50'-0", 60'-0" (12.2m, 15.2m, 18.3m)
- Clear span, long: 70'-0", 80'-0", 90'-0", 100'-0" (21.3m, 24.4m, 27.4m, 30.5m)

d. If pre-engineered components are to be used for the multi-purpose room, then the economy and feasibility of using them for the entire youth center shall be investigated.

C. Building Systems

The architectural, mechanical, electrical and environmental systems shall comply with Air Force standards listed in Table 7-2, 7-4, 7-5 and 7-6 as well as satisfy the following general criteria:

1. Energy Budget

The building energy consumption shall not exceed the energy amounts in Table 4-1 based on 50 operating hours weekly, with hot water as a process load. The EBF analyses shall be based on these operating hours rather than the actual operating hours. The design energy budget figures (EBFs) shall be broken down into heating, cooling, ventilation and lighting. If the design EBF exceeds the required EBF by 10 to 14.9 percent, a statement must be provided explaining this situation. If the design EBF exceeds the required EBF by 15 percent or more, a detailed summary and explanation must be provided by the A.E.

Table 4-1: Energy Budgets

	Region 1	Region 2	Region 3	Region 4	Region 5	Region 6	Region 7
CDD†	<2000	<2000	<2000	<2000	<2000	>2000	>2000
HDD††	>7000	5500-7000	4000-5500	2000-4000	0-2000	0-2000	2000-4000
Budgets*	65,000	60,000	50,000	45,000	40,000	45,000	45,000

†Annual Cooling Degree Days

††Annual Heating Degree Days

*Energy Consumed in BTU/Ft.²/Yr.

2. Solar Applications

- a. Normal passive solar considerations described in *AFM 88-15* shall be considered in the design, including building shape and orientation, zoning of interior space for heating and lighting needs, skylighting, protected entrances, window locations and treatment, shading devices, insulation, and overhangs. Moveable night insulation shall be considered for all windows to control heat gain or loss, especially where the heating degree days exceed 5000.
- b. Unique passive solar applications that are not part of normal design and are not listed in *AFM 88-15*, shall be employed only where they are proven to be cost effective and will provide at least 25 percent of the required space heating or cooling, or 35 percent of the lighting required for the facility. Insolation at the base must exceed an annual daily average of 300 Langleys before unique passive solar heating can be considered, or 200 for daylighting applications. The AE will strive to optimize the size of the passive solar application.
- c. Active solar applications shall be provided only where they are proven to be cost effective by the base or MAJCOM through solar assessment techniques discussed in current Air Force directives, and will provide a minimum of 25 percent of the required space heating or cooling and 35 percent of the domestic water heating on a yearly basis. The AE will strive to optimize the size of the active solar system.

Table 4-2:
Artificial Lighting Criteria

	Required Light Fixture	Level of Illumination in Foot-Candles	Recommended Lamp Type
Social Spaces			
Game Room	1, 6†	30	A
Lounge	1, 2, 8†	15	A
Snack Facilities:			
□ Food Preparation Area	5, 7	50	A
□ Eating Area	1, 2†	15	A
□ Vending Area	†	15	A
Structured Activity Spaces			
Meeting Rooms	2	30	A
Project Rooms	1, 7	50	A
Music Rooms	—	30	A
Multi-Purpose Space			
Multi-Purpose Room	2, 3, 4, 6†	100	B & indirect lighting for dances
Stage	2, 9	variable	Stage lighting
Administration Spaces			
Sign-in/Check-out Desk	7 or 8†	30	A
Staff Offices	8	50	A
Support Spaces			
Lobby	1†	15	A
Storage	—	15	A
Toilets & Changing Rooms	5, 7	20	A
Maintenance & Mechanical	—	15	A
Corridors and Stairs	—	15	A
Outdoor Spaces			
Main Entry Area	5, 6	10	
Athletic Fields	5, 6	5	
Playgrounds	—	5	
Hard Court Area	5, 6	10	
Parking Lot & Service Area	5, 6	1	

Required Light Fixture Key

- (1) Adjustable for changing furniture and equipment layouts.
- (2) Switched by dimmers to vary light illumination level.
- (3) Ballasted to minimize stroboscopic effects on moving objects.
- (4) Provided with glare-reducing lens.
- (5) Provided with moisture-resistant housing.

- (6) Provided with impact-resistant lens or protective grille.
- (7) Under or over the counter lighting.
- (8) Local task lighting.
- (9) Stage lighting.
- † Controllable from Sign-In/Check-Out Desk

Recommended Lamp Type Key

- (A) Warm white fluorescent
- (B) Phosphor coated metal halide

3. Natural Daylighting

Windows and/or skylights are advised for all spaces except storage rooms, toilet and changing rooms, and mechanical rooms. Blinds, light shelves, screens and translucent glazing materials shall be used where necessary to eliminate reflected glare, direct sun penetration, and silhouetting. Light shelves should be used to provide daylighting to interior spaces from perimeter windows.

4. Electrical Systems

The design shall comply with the standards listed in Table 7-5, as well as satisfy the following general criteria:

- a. **Artificial Illumination.** All artificial lighting fixtures shall be capable of independent switching, and shall be located to allow for relamping from floor or cat walk with the aid of portable ladders or scaffolding if necessary. Where used with daylighting applications, these fixtures shall incorporate ambient light dimmers to reduce electric power requirements automatically. Light fixture requirements, recommended types, and minimum levels of illumination at 3'-0" (.91 m) above the finished floor are referenced in Table 4-2.
- b. **Communications.** A centrally controlled public address and two-way communication system is required for the facility.
 - At least one public address speaker shall be provided in each room except storage rooms, toilet and changing rooms, and mechanical rooms. A speaker shall be provided for every 800 ft.² (74.3 m²) of net floor area.
 - At least one two-way communication station shall be provided at the entrance of every activity, support, and staff space.
 - One or more telephone outlets shall be provided in each staff room. A public telephone shall be located in or adjacent to the lobby. Where services are anticipated, television and radio broadcasting outlets shall also be provided.

5. HVAC Systems

HVAC controls will be a critical part of the mechanical system. A computer analysis is required of all new facilities. It will predict energy consumption and energy system performance. It can optimize electrical and architectural alternatives. Optimization will be based on a life cycle cost study. The methodology for this study is described in the National Bureau of Standards Handbook 135, *Life Cycle Cost Manual for the Federal Energy Management Program*. The computer analysis shall also conform to Air Force directives on this subject. The weather zones referenced below are defined in AFM 88-15, Chapter 6. (Air conditioning is allowed in all zones when purchased entirely with non-appropriated funds. Toilets and changing rooms shall not be air conditioned regardless of climatic conditions.):

Weather Zone A: Evaporative cooling shall be provided.

Weather Zones B and C: Mechanical ventilation only shall be provided.

Weather Zone D: No mechanical ventilation or air conditioning shall be provided.

a. Heating. The heating system shall be zoned to provide consistent temperature levels in spaces subject to different solar exposures and heat gain. Inside heating design dry bulb temperatures shall be 60°F for the multi-purpose room and 70°F for the rest of the building.

b. Mechanical Ventilation. The room supply air rate shall not be less than .80 cfm per ft.² of occupied floor space. The outside air ventilation shall be at least 6 cfm per ft.² at times when the outside is warmer than the building spaces, and 5 cfm per ft.² at times when the outside is cooler than the building spaces.

c. Evaporative Cooling. When allowed, evaporative cooling shall provide a maximum indoor temperature of 80° F dry bulb.

d. Air Conditioning. Where air conditioning is allowed, the inside comfort design temperature shall be 15°F less than the 2½ percent outside dry bulb weather conditions, but shall not exceed 78°F or be less than 75°F. The relative humidity during cooling shall be at least 50 percent or shall at least equal the outside air dewpoint design temperature.

6. Acoustics

The facility shall be designed with the acoustical properties outlined in Table 4-3.

7. Plumbing

a. The domestic hot water temperature provided in lavatories, showers, and service sinks shall not exceed 105°F.

b. Shut-off valves shall be provided at all fixtures.

c. Floor drains shall be located in all toilet and changing rooms.

Table 4-3:
Acoustic Design Standards

	Maximum Expected Generated Sound Level	Ambient Noise	Sound Insulation	Sound Absorption
	PWL ¹	PNC ²	STC ³	NCR ⁴
Multi-Purpose Room	95	35-40	47-52	.65-.75
Other Activity Spaces	80	40-45	50-60	.65-.75
Office & Support Spaces	60	30-35	37-47	.65-.75

¹PWL = Magnitude of Sound

²PNC = Preferred Noise Criteria

³STC = Sound Transmission Class

(all of the above measured in decibels)

⁴NCR = Noise Reduction Coefficient

Figure 5-1:
Game Room
Size and Layout

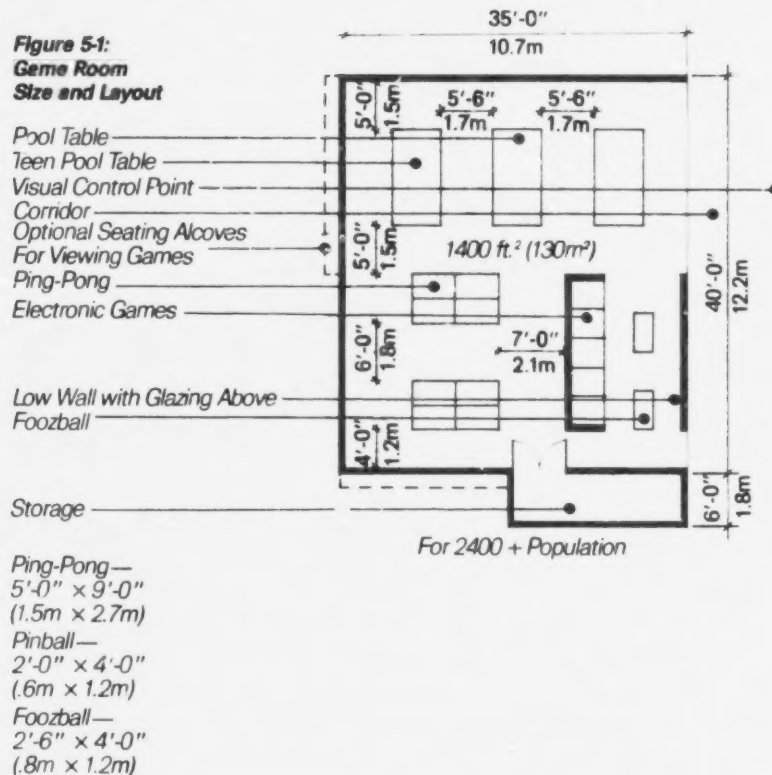


Table 5-1:
Game Room Sizes

	Game Area		Associated Storage	
	ft.²	m²	ft.²	m²
EYP† 250-600	375 ..	34.8	25	2.3
EYP† 601-1200	550 ..	51.0	50	4.6
EYP† 1201-2400	800 ..	74.3	75	7.0
EYP† 2401+	1400 ..	130.0	100	9.3

† Eligible Youth Population

Table 5-2:
Game Room Equipment Sizes

	Dimensions	Minimum Clearance
Pool Table (Adult or Teen)	5'-9" x 10'-9" (1.75m x 3.28m)	5'-0" (1.52m) on all sides 9'-0" (2.74m) min. ceiling height
Electronic Games	3'-0" x 6'-0" (.91m x 1.83m)	4'-0" (1.20m) in front of screen
Table Tennis	5'-0" x 9'-0" (1.52m x 2.74m)	3'-0" (.91m) on all sides 7'-0" (2.13m) on ends
Card Tables	3'-0" x 3'-0" (.91m x .91m)	2'-6" (.76m) on all sides

A. Social Spaces

1. Game Room

a. Use. Primary use is for active, moderately noisy sports like table tennis, billiards, bumper pool, foosball, pinball, electronic games, and similar arcade amusements. Space shall be provided for observing, waiting for turns, and lounging. If combined with a lounge area, board games may be played here as well. If combined with a snack area, space for vending machines, tables, booths and/or counter space must be considered.

b. Circulation and Relationships. The game space shall be visible from the entry, the snack bar, and the supervisor's desk. As this room will be used continually by all youth, a central location in the building shall be chosen. Direct access to an outdoor activity space can broaden the entertainment options, increase the visual size of the space, and provide natural light. A nearby lounge for TV, board games, and conversation would be a restful counterpoint to the hectic activity in the game room.

c. Size and Layout Variables. Figure 5-1 shows a typical layout for a game room. Size and layout will depend on whether this area must function as a lounge and snack area as well as game room. Table 5-1 provides recommended sizes according to user population. For the larger game rooms, the subdivision of activities is advisable.

d. Furnishings and Equipment. Table 5-2 lists the sizes of equipment and minimum clearances. Other furnishings include:

- cue racks
- wall clock
- folding game tables
- lounge seating
- announcement board
- lighting fixtures over game tables

e. Materials and Finishes

- Floor: Resilient tile or carpet.
- Walls: Durable, cleanable, seamless wall covering such as vinyl covered or painted masonry or gypsum board, with areas for tack-ups and displays. The upper portion of the walls, beyond arm's reach, may be covered with a more textured, less utilitarian material such as fabric or wood. All corners shall be protected with sturdy corner guards.
- Ceiling: Acoustically absorbent.

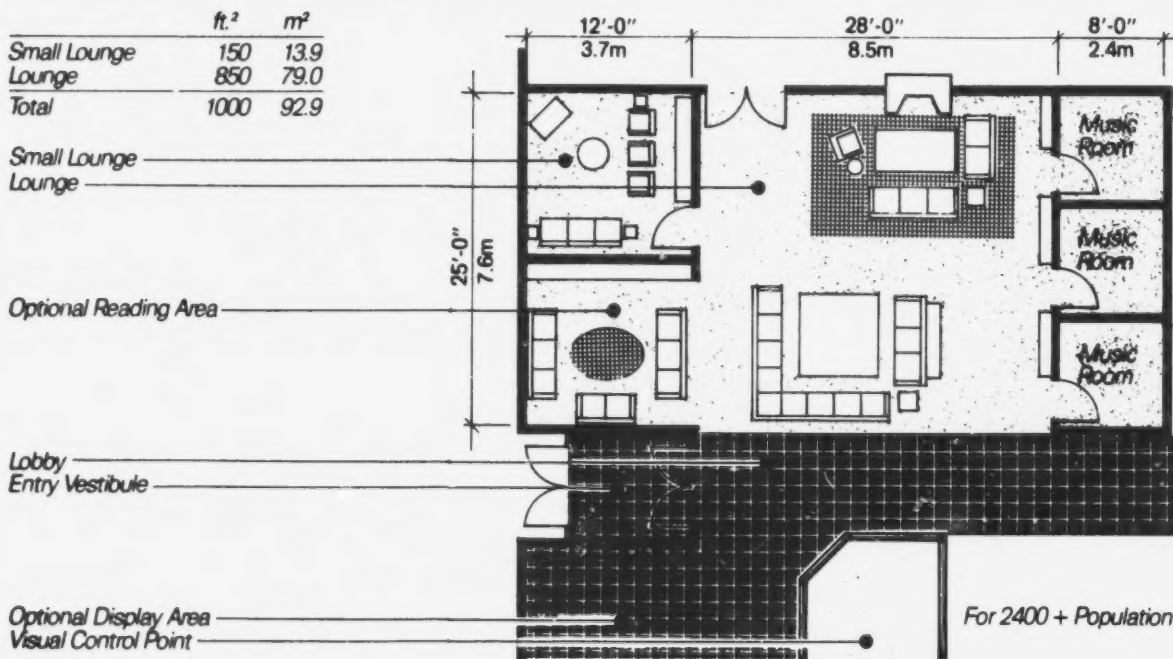
2. Lounges.

a. Use. The organization of lounge space within the building is less constrained by functional and special limitations than other activity areas, and thus, many variations are possible. In all cases, at least two lounges shall be provided, one devoted to moderately noisy socializing (e.g., lively conversations, informal gatherings, table games, snacking, etc.), and another smaller one for solitary or subdued activities (e.g. TV viewing, reading, study, focused conversation). The lounges can also be used for other activities appropriate to their location in the youth center. The large lounge may serve as overflow from the large activity space, or, in the smaller centers, may be used for dances. The small lounge, if located adjacent to the structured activity rooms, can serve as a place for socializing before class or during class breaks. Lounges located in view of the main entrance provide a pleasant place to read, watch TV, or just sit while waiting for parents or friends. Lounges looking onto the multi-purpose room and rustically furnished can be used for spectator viewing or as seating during rest periods.

b. Circulation and Relationships. As indicated, the lounges function well in several different locations depending on their intended purpose. A large lounge located just off the main entrance to the youth center, opening onto the game room, and in view of the surveillance booth is strongly recommended. A smaller lounge located near the structured activity rooms, meeting rooms, or multi-purpose space, and offering greater privacy for teens, is also recommended. The large lounge can accommodate a number of activities, such as table games, TV viewing, and reading, by skillfully subdividing the space with visual and acoustical barriers. The small lounge shall be geared to teen-oriented activities such as TV viewing, reading magazines, playing cards, etc. To a great extent, the seating arrangement will determine the circulation through these spaces, and, for this reason, the design of these spaces shall proceed from the choice of furniture.

c. Size and Layout Variables. Figure 5-2 shows possible layout for the large and small lounges. Table 5-3 provides recommended sizes accord-

Figure 5-2:
Large & Small Lounge
Size and Layout



ing to user population. In the larger lounges, the interior architecture and furniture arrangement shall define separate areas for different types of socializing: an intimate grouping around a fireplace for quiet conversation, a collection of tables in the corner for card playing, a place to sprawl in front of the TV. The ability of the space to accommodate dances or large meetings, however, shall not be sacrificed.

d. Furnishings and Equipment.

- domestic-style furnishings, e.g., sofas, lounge chairs, coffee tables, area rugs, curtains, etc. Furniture shall be moveable, or, if preferable, modular.
- folding tables and chairs for board games and card games
- sturdy area lamps or overhead light fixtures
- television and video player with cable and/or antenna hook-up
- magazine racks and bookcases
- youthful wall decoration inspired by the region or executed by local youth (e.g., a painted panorama of the neighborhood, a photomural of local children, etc.)
- stereo
- piano (optional)

Table 5-3: Lounge Sizes

	Large Lounge Area		Small Lounge Area	
	ft. ²	m ²	ft. ²	m ²
EYP† 250-600	120	11.2	—	—
EYP† 601-1200	200	18.6	—	—
EYP† 1200-2400	450	41.8	150	13.9
EYP† 2401+	850	80.0	150	13.9

†Eligible Youth Population

e. Materials and Finishes.

- Floor: Unless this area is to serve also for dancing or project space, carpet is the appropriate floor covering. If a more flexible space is required, wood, rubber, or resilient flooring may be used.
- Walls: A warmer, less utilitarian wall covering than that used in the activity areas, such as a textured masonry, wood or fabric finish, is preferred. Nevertheless, the wall material shall be durable and cleanable.
- Ceiling: Acoustically absorbent

f. Special Environmental Considerations. Individual lamps or overhead fixtures shall be used to give character to the subspaces in the large lounge.

3. Snack Facilities

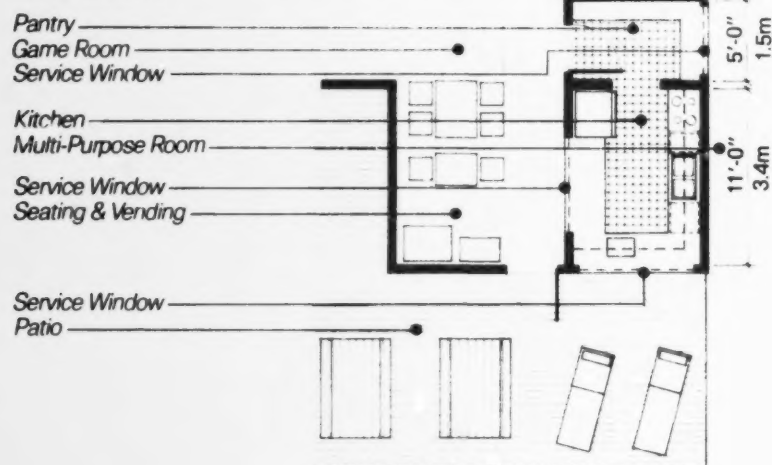
a. Use. Snacking is a natural accompaniment to vigorous play and an enjoyable event in and of itself. The snack bar will, in all probability, be the heart of all social activity and should be a comfortable place to "hang out." Snack service will be most popular during periods of drop-in use - generally after school, evenings, and weekends. However, this space may also serve as the breakfast area for a structured, before-school drop-off program or summer day camp. Food preparation is limited to easy-to-prepare items such as sandwiches and soft drinks, foods that can be heated in a microwave oven, and packaged foods such as candy, cakes, and cookies. In order to service cooking classes, potluck suppers, and special events, the kitchen must also be equipped for full-scale food preparation. Snack facilities should consist of an area for food preparation and customer service (snack bar), a vending area, and an eating area.

b. Circulation and Relationships. The snack bar must be adjacent to the eating area which may overlap with the lounge spaces and/or game room. If possible, the snack bar shall be visible from the entry to attract newcomers, and have direct access to the multi-purpose room for use as a serving pantry for parties, banquets, and dances. In the smaller youth centers, the vending area will probably not be a separate area, but, rather, a part of the eating area, lounge, or game room. To encourage outdoor play, an exterior serving counter with bar stools, or patio with picnic tables is recommended.

The internal organization of the snack preparation area should resemble a domestic kitchen, with one counter servicing the eating area and game room, another servicing the multi-purpose room, and a third, if possible, servicing an outdoor eating area. In order to supplement the storage within the food preparation area, an adjacent storage room, preferably located near a service entrance, is required. Professional equipment is not necessary, but a soda fountain, popcorn popper, and ice machine are recommended.

Figure 5-3:
Snack Facilities
Size and Layout

For 600-1200 Population
250 ft.² (23.2m²)



The indoor and outdoor eating areas may be fitted with tables and chairs, a counter and bar stools, semi-private booths, picnic tables, or any combination of the above. Since waitress service is not provided, additional circulation space is advised.

c. Size and Layout Variables. Figure 5-3 shows a typical layout for the snack bar. Recommended sizes for the food preparation and eating area according to the user population are provided in Table 5-4. These sizes may be modified if cooking classes or a before or after school program require additional space.

The organization of equipment in the food preparation area shall be carefully thought through for ease in preparing the food and servicing the customers. Counter space and over and under the counter storage shall be maximized.

For 2400 + Population
600 ft.² (55.7m²)

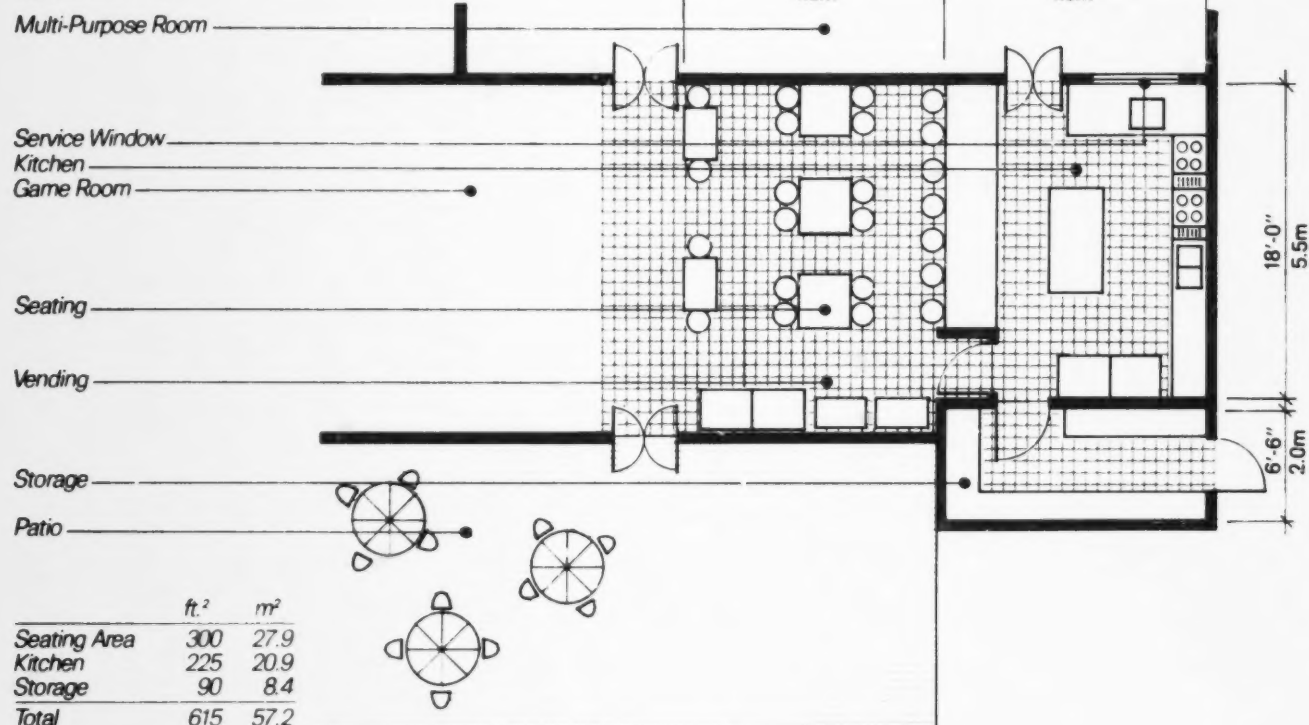


Table 5-4:
Snack Facility Sizes

	Food Preparation		Inside Eating		Vending		Food Storage	
	ft. ²	m ²	ft. ²	m ²	ft. ²	m ²	ft. ²	m ²
EYP+ 250-600	90	8.4	counter space		30	2.8	—	—
EYP+ 601-1200	90	8.4	90 ..	8.4	30	2.8	25	2.3
EYP+ 1201-2400	150	13.9	200 ..	18.6	35	3.2	40	3.7
EYP+ 2401+	225	20.9	300 ..	27.9	45	4.2	45	4.2

Recommended Dimensions:

- A minimum of 16'-0" (4.88m) of counter space 2'-0" (.61m) deep
- 4'-6" (1.37m) clearance between parallel counters.

The comparative sizes for each of the various types of seating are provided in Table 5-5.

The layout of the eating area should have a casual feel, similar to a soda fountain, with a combination of seating for both long-term and short-term users (e.g., booths and bar stools, or, tables and a stand-up counter). If space allows, tables oriented towards the game room and tables offering more privacy shall both be included.

Table 5-5:
Snack Bar Seating Dimensions

	Minimum Unit Dimensions		Floor Area†		Number Seated
	ft. x ft.	m x m	ft. ²	m ²	
Barquettes	5'-6" x 4'-0"	1.6 x 1.2	22	2.0	4
2-Person Table (square)	4'-0" x 6'-0"	1.2 x 1.8	24	2.2	4
2-Person Table (square)	2'-0" x 6'-0"	.6 x 1.8	12	1.1	2
4-Person Table (round)	6'-0" x 6'-0"	1.8 x 1.8	36	3.3	4
Counter 2'-0" Deep	2'-0" x 4'-0"	.6 x 1.2	8†† ..	.74††	

†Not including aisleway space.

††Per person

Minimum Double Loaded Aisle: 3'-0" (.9m)

Minimum Single Loaded Aisle: 2'-6" (.76m)

Note: Area building codes make provision for sizing of aisles and cross aisles and corridors in seating areas. Applicable building codes shall be consulted for guidelines.

d. Furnishings and Equipment.

- residential kitchen base and wall cabinets
- counter tops and splash board of plastic laminate
- residential appliances including range with exhaust hood, refrigerator/freezer, microwave oven and dishwasher
- two-compartment stainless steel sink and garbage disposal
- optional soda fountain and ice machine
- optional popcorn popper
- optional snow cone machine
- display racks for packaged snack food
- built-in shelving in food storage room
- serving counter with built-in seating
- built-in movable tables and seating
- picnic table or outdoor eating counter and stools
- menu board
- vending machines
- cash register
- kitchen tools

To increase kitchen size and service provide:

- commercial dishwasher with tray drop-off
- preparation space (for cooking classes)
- convective type oven
- separate cashier desk
- extra storage
- second range
- large coffee maker
- tray refrigerator
- grill and fryer

e. Materials and Finishes.

- Floor: Resilient or ceramic tile or other easily cleanable floor surface is recommended. In the food preparation area, the floors shall be heat and stain resistant.
- Walls: Vinyl or other easily cleanable covering for the eating area is recommended. Where exposed to heat and moisture, plastic laminate or ceramic finish is more appropriate.
- Ceiling: Acoustically absorbent.

B. Structured Activity Spaces**1. Meeting Rooms**

- a. Use. In smaller youth centers, meeting rooms and project spaces may be one and the same or differentiated. If separate, meeting rooms provide a place for local clubs and organizations, special-interest groups, sports teams, and parent groups to assemble. They may also be used for supervised free play for children, before and after school programs, and/or classroom activities.
- b. Circulation and Relationships. The meeting room(s) shall be acoustically separated from the noisier parts of the building and from each other. Surveillance from the central booth is not necessary since the activities in these rooms will be supervised. For this reason, a location in the teen area would be appropriate.
- c. Size and Layout Variables. Approximate sizes for meeting rooms according to user population are provided in Table 5-6. The room shall be dimensioned for classroom use with one end dominant (the end with the blackboard, projection screen, and no windows). If movies or lectures are to be held here, the room shall be designed to expand into an adjoining space to accommodate larger groups.
- d. Furnishings and Equipment.
 - scaled down conference table or individual tables with chairs
 - motion picture screen
 - room darkening devices
 - lectern
 - blackboard
- e. Materials and Finishes.
 - Floor: Carpet, resilient tile, or other material soft enough for children to sit on; floor mats for exercise and tumbling programs shall also be provided.
 - Walls: Vinyl or fabric covered masonry or gypsum board, or other washable material suitable for tack-up.
 - Ceiling: Acoustically absorbent.

Table 5-6:
Meeting Room Sizes

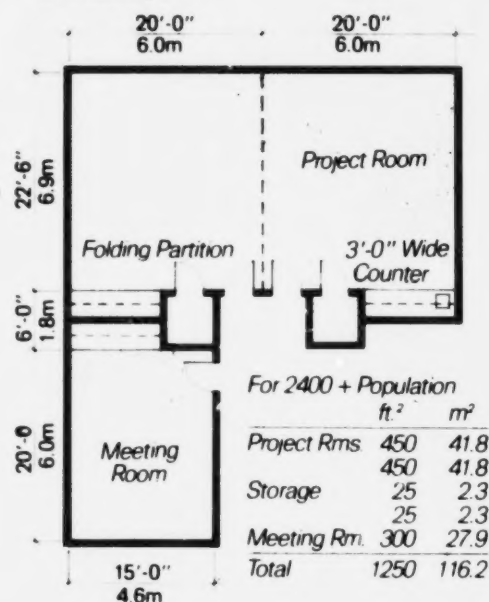
	Meeting Room Area	
	ft. ²	m ²
EYP† 250-600	Combined w/Project Room	
EYP† 601-1201	Combined w/Project Room	
EYP† 1201-2400	300	27.9
EYP† 2401+	300	27.9

†Eligible Youth Population

2. Project Rooms

- a. Use. Project spaces will be equipped for arts and crafts type activities, including ceramics, wet and dry media easel art, fabric craft, leatherwork, woodcraft, small sculpture, jewelry-making, mixed media, and scout troop projects. Some project rooms may require specialized equipment or serve a single purpose. These include darkrooms (sinks, lightproof door, shelves for chemicals, enlargers, water-proof floor and wall covering, etc.), professional ceramic shops (pottery wheels, special floor and wall finishes, a kiln), and dance or gymnastic studios (mirrored walls, dance bar, exercise mats, balance beam).
- b. Circulation and Relationships. Project rooms shall be grouped with meeting rooms in the part of the building devoted to organized activity (near the teen entrance). Project rooms shall be closer to the game room than meeting rooms.
- c. Size and Layout Variables. Figure 5-4 shows a typical layout for project and meeting rooms. Recommended project room sizes and storage requirements are listed in Table 5-7 according to user population.

Figure 5-4:
Project and Meeting Rooms
Size and Layout



- d. Furnishings and Equipment.
- double-bowl stainless steel sink
 - plastic laminate or wood counter tops
 - wood block work bench
 - large wood or plastic laminate project tables
 - lockable storage space for supplies
 - specialized equipment such as pottery wheels, kiln, gymnastics equipment, mirrors, etc.
- e. Materials and Finishes.
- Floor: Resilient or ceramic tile or industrial wood block; floors shall be stain and moisture resistant and cleanable.
 - Walls: Heavy duty vinyl covering or composition tack board; walls shall be washable and stain and moisture resistant.
 - Ceiling: Acoustically absorbent.

Table 5-7:
Project Room Sizes

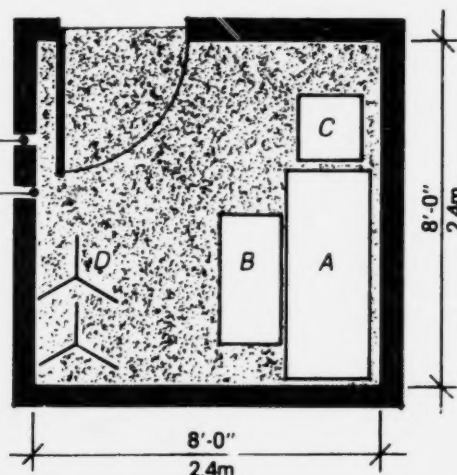
	Project Room Area		Associated Storage	
	ft. ²	m ²	ft. ²	m ²
EYP† 250-600	225 ...	20.9	10	.9
EYP† 601-1200	300 ...	27.9	20	1.8
EYP† 1201-2400	2@300	2@27.9	2@20 ..	2@1.8
	-or-			
	1@600 ...	55.8		
EYP† 2401+	3@300	3@27.9	3@20 ..	3@1.8
	-or-			
	2@450	2@41.8		

† Eligible Youth Population

Figure 5-5:
Music Rooms
Size and Layout

3.5" Sound
Attenuation Batts
2 Layers 5/8" Gyp. Bd.
On Wall Interior

Equipment:
A—Studio Piano
B—Bench
C—2 Stacking Chairs
D—2 Music Stands



3. Music Rooms

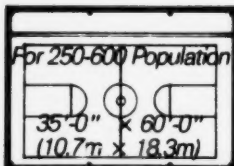
- a. Use. In the larger youth centers, one or more small rooms for individual instruction and practice of music shall be set aside.
- b. Circulation and Relationships. The music rooms shall be located in the structured activities area as far away from the game room and multi-purpose room as possible.
- c. Size and Layout Variables. Figure 5-5 shows the typical layout of a music room. In general, 60 to 64 ft.² (5.6-5.9 m²) per music room is an adequate size.
- d. Furnishings and Equipment.
- 2 chairs
 - 2 music stands
 - a piano (optional)
- e. Materials and Finishes.
- Floor: Carpet.
 - Walls: Paneled or fabric covered masonry or gypsum board.
 - Ceilings: Acoustically absorbent
- f. Special Environmental Considerations.
- Acoustics: The minimum sound transmission coefficient (STC) between a music room and other spaces is 60.

For Acoustic Separation:

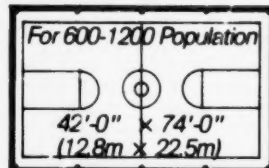
1. Install Isolated Floor System.
2. Install Separated Interior Stud System.
3. Control Noise of HVAC System.
4. Use Surface-Mounted Lighting System.
5. Caulk and Seal Around All Openings.
6. Install 3.5" Sound Attenuation Batts On Ceiling.
7. Install Isolators On All Doors Into Space.

Figure 5-6:
Multi-Purpose Room
Size and Layout

Elementary School



Jr. High Court



Pre-Engineered Structures

A. Rigid Frame

Spans—

10'-0" to 200'-0"
(3.0m to 61.0m)

Height—

10'-0" to 30'-0"
(3.0m to 9.1m)

Bay Spacing—

20'-0" or 25'-0" std.
(6.1m or 7.6m std.)

B. Clear Span Truss

See Manufacturing Data

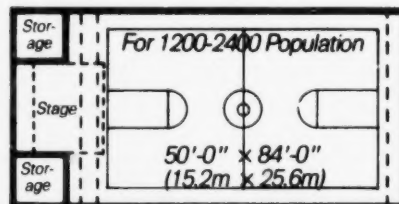
C. Special Structures

1. Space Frame

2. Tensile Fabric—
Frame-Supported

3. Tensile Fabric—
Air-Supported

High School Court



High School Court

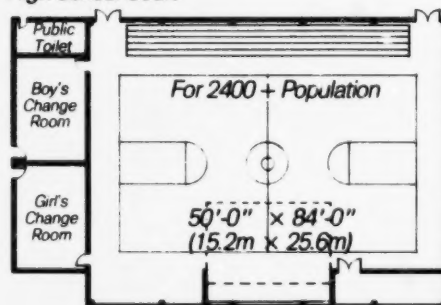


Table 5-8
Multi-Purpose Room Sizes

	Multi-Purpose Room		Basketball Court Dimensions	
	ft. ²	m ²	(court only)	(w/Perimeter Clearance)
EYP† 250-600	2870	266.6	Elementary School 35'-0" x 60'-0" (10.7m x 18.3m)	41'-0" x 70'-0" (12.5m x 21.3m)
EYP† 601-1200	4000	371.6	Junior High School 42'-0" x 74'-0" (12.8m x 22.5m)	50'-0" x 80'-0" (15.2m x 24.4m)
EYP† 1201-2400	5400	501.7	Senior High School 50'-0" x 84'-0" (15.2m x 25.6m)	60'-0" x 90'-0" (18.3m x 27.4m)
EYP† 2401+ +1600††	5400 148.6	501.7 148.6	Senior High School 50'-0" x 84'-0" (15.2m x 25.6m)	70'-0" x 100'-0" (21.3m x 30.5m)

† Eligible Youth Population

†† For bleachers and extended court overruns

C. Multi-Purpose Space

1. Multi-Purpose Room

a. Use. This space is the primary indoor sport activities area. It must function well for a variety of sports including basketball, volleyball, gymnastics, martial arts, roller skating, and dance and may include changing rooms and/or bleachers. This space must also provide a comfortable environment for dances, parties, banquets, dramatic performances, movies, and awards ceremonies. To serve this dual purpose, the image of the room must be alterable: athletic equipment shall be stored out of sight in a closet or behind curtained alcoves; different types of illumination shall provide appropriate lighting for various activities (sports games, dances, and stage performances); tables and chairs shall be stackable or recess into the wall as a unit; and the acoustics of the space shall be suitable for dances and sports games as well as dramatic performances.

b. Circulation and Relationships. The multi-purpose room shall be readily accessible from the teen/athletic entrance(s). It shall also be adjacent to the equipment issue room, locker rooms, snack bar window, equipment storage room, and special event/costume storage room. Controlled access is required from the multi-purpose room to outdoor activity areas, possibly via the equipment issue desk. The multi-purpose space shall also be directly accessible from the main entrance lobby (as will the coat closet, rest rooms, and snack bar) to accommodate evening functions after the building closes. In addition, the space itself shall be divisible by retractable partitions to permit the activities of different user groups to occur simultaneously without visual interference. If possible, a rear entrance onto the stage from the changing rooms is recommended.

c. Size and Layout Variables. Figure 5-6 shows the court sizes and recommended clearances for basketball courts. Table 5-8 provides recommended sizes for the multi-purpose room based on user population, the dimensions of the basketball court, and the standard spans for pre-engineered components. While a regulation high school basketball court is preferred, square footage of the multi-purpose room is limited by the allowable size of the overall facility.

Figure 5-7:
Folding Stages
Performing Area

Large:

For Dance/Music
1200 ft.² (111.5m²)

For Drama
800 ft.² (74.3m²)

Medium:

For Dance/Music
980 ft.² (91.0m²)

For Drama
560 ft.² (52.0m²)

Small:

For Dance/Music
690 ft.² (64.1m²)

For Drama
360 ft.² (33.5m²)

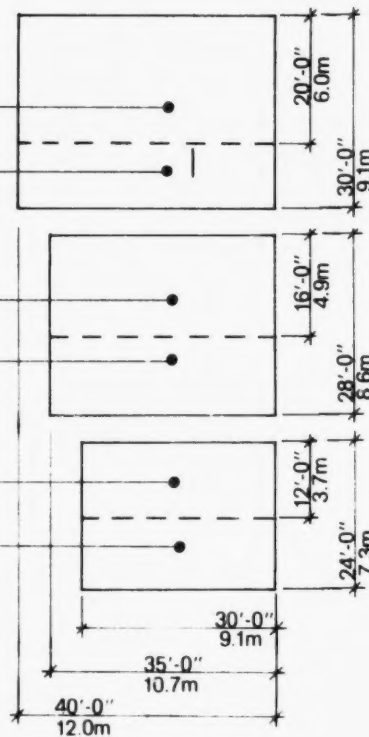


Table 5-9:
Telescopic
Bleacher Dimensions

Number of Rows	Extended Width [†]		Overall Height ^{††}		Retracted Width		Seat Count*
	ft	m	ft	m	ft	m	
5	9'-2"	2.8	4'-8"	1.4	3'-3"	.99	65
10	19'-2"	5.8	8'-8"	2.6	3'-4"	1.01	130
15	29'-2"	8.9	12'-8"	3.9	3'-5"	1.05	195
20	39'-2"	11.9	16'-8"	5.0	3'-8"	1.10	260
25	49'-2"	15.0	20'-8"	6.3	4'-4"	1.30	325
30	59'-2"	18.0	24'-8"	7.5	4'-7"	1.40	390

*Based on Maximum 24" (610mm) Row Spacing. Minimum is 22" (559mm).

††Based on Minimum 24" (610mm) Row Spacing. 10" (254mm) and 12" (305mm) are also used.

*Estimated capacity per 20" (508mm) Row Spacing. 10" (254mm) and 12" (305mm) are also used.

d. Furnishings and Equipment.

□ Athletic Equipment:

- nets
- balls
- exercise mats
- vault
- balance beam
- scoreboard
- 2 clocks
- roller skates and storage rack
- height-adjustable basketball hoops and backboard
- hardware sockets for floor, wall, or ceiling mounted sports equipment. Check with manufacturers to determine if reinforcing is required.

□ Special Events Equipment:

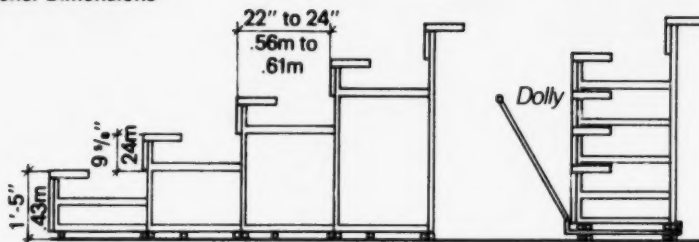
- movable partitions
- room darkening devices
- projection screen
- stage curtain
- sound system for music and lectures

□ Stage (optional): Stages in the multi-purpose room may be either fixed or flexible. While a fixed stage is generally better suited to its purpose, the overhead of dedicated floor space may not be feasible. Flexible or folding stages are of two types: telescopic unit and demountable composite. A telescope stage is made of a set of folding stage panels that collapse into a unit. A demountable composite stage is made of separate panels which must be fitted together. Both systems can accommodate a variety of stage sizes for different events. Figure 5-7 provides the performing area required for dance music, and drama, and critical dimensions for both types of flexible stage.

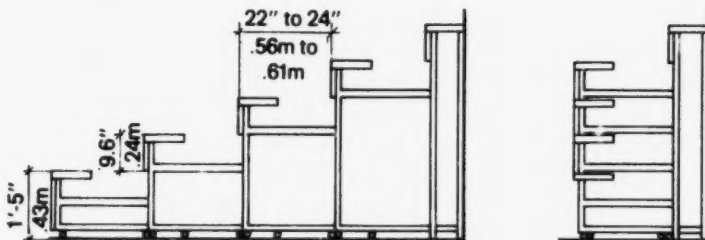
□ Seating: Seating is required for performances as well as for dances and other social events. Storage requirements will vary with design. Folding chairs are typically stored on trucks holding up to 42 chairs on an 8'-4" x 1'-8" (2.5m x .51m) unit that is 3'-6" (1.1m) high. Folding tables are necessary for dances and other events. Storage requirements will vary with design. Folding tables of a 6'-0" to 8'-0" (1.8 - 2.4m) length typically are stored on a 6'-6" x 2'-2" (2.0 x .66m) unit that is 3'-0" (.91m) high.

□ Bleachers (optional): Typical dimensions for bleachers are provided in Table 5-9 and Figure 5-8.

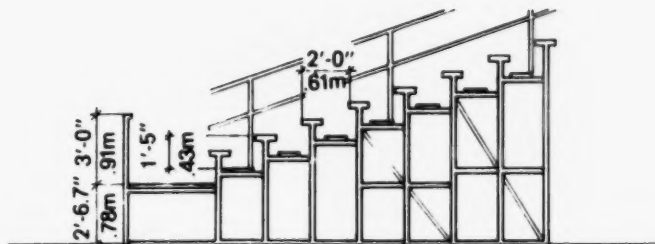
Figure 5-8:
Multi-Purpose Room
Bleacher Dimensions



Portable Telescopic Bleachers



Telescopic Bleachers (Wall Attached)



Fixed Grandstand (Elevated)

e. Materials and Finishes.

- **Floor:** The floor shall be sufficiently resilient to permit the natural bouncing of balls and encourage running and jumping by participants. The floor shall not be so soft as to slow activity or so hard as to cause jarring and injury. The surface must be textured to provide adequate traction but should not cause floor burns or prevent the space from being used for roller skating, if requested. If court markings are likely to change, a hard-wood floor is suggested. If court markings can be made permanent and if sound absorption or traction are important, synthetic rubber or resilient flooring (in a contrasting color to court markings) is recommended. In either case, the floor covering must be continuous without significant joints, capable of withstanding hard knocks and extended vigorous use, finished to reduce glare from reflected light, and require only routine maintenance with standard equipment.
- **Walls:** Painted masonry. Walls must withstand impact loads, be nonabrasive, and padded to a wainscot height of at least 6'-0" (2.0 m). Walls shall be flush, without projections, sharp corners, or surface-mounted items such as pipes, fire extinguishers and cabinets. Reinforcement may be required around wall-mounted equipment such as scoreboards and basketball backboards.
- **Ceiling:** The structural members supporting the roof may be exposed in the multi-purpose room, and must be able to support ceiling-mounted equipment (scoreboards, basketball backboards, catwalks, stage lights, etc.) and withstand impact loads of projectiles. Ceilings shall be two-story height, (the minimum clear unobstructed ceiling height is 23'-0"), but accessible for cleaning and maintenance.

Figure 5-9:
Sign-In/Check-Out
Size and Layout

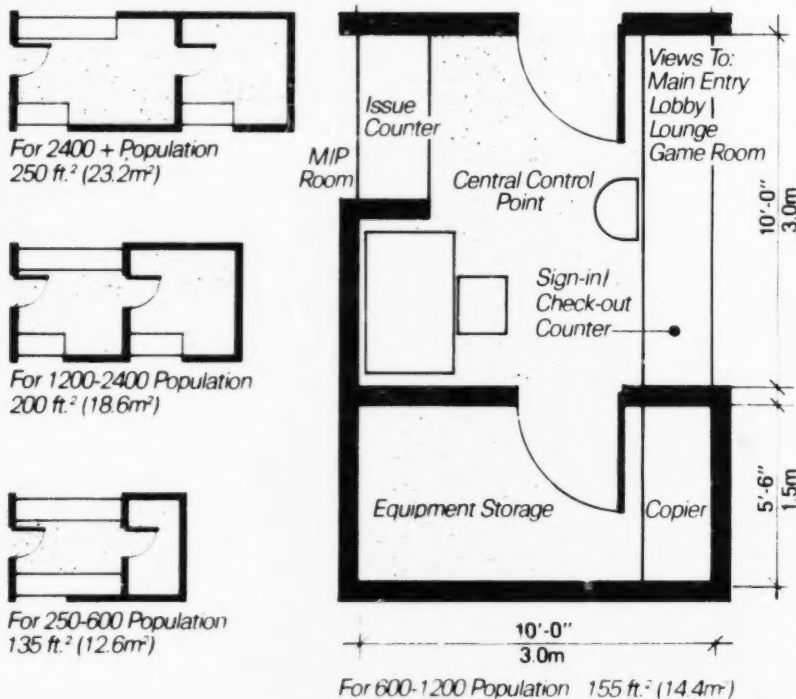


Table 5-10:
Sign-In/Check-Out Desk Sizes

	Sign-In/ Check-Out Area		Games & Equipment Storage Space	
	ft. ²	m ²	ft. ²	m ²
EYP† 250-600	90	8.4	90	8.4
EYP† 601-1200	100	9.3	90	8.4
			+75 ft. ² (7.0m ²)††	
EYP† 1201-2400	100	9.3	100	9.3
			+200 ft. ² (18.6m ²)††	
EYP† 2401+	150	13.9	100	9.3
			+300 ft. ² (27.9m ²)††	

† Eligible Youth Population

†† Additional General Storage
Space

center members, check-out of games and athletic equipment, and sign-up for athletic activities and special events. Staff members at this desk are also responsible for answering the phone, and making announcements on the public address system.

- b. Circulation and Relationships.** In order for staff members to maintain communication and provide adequate surveillance throughout the building, the sign-in/check-out desk must be functionally central with views to each of the principal components of the center, including the game room, multi-purpose room, lounges, lobbies, and major circulation routes. Also serving as a reception desk, the control desk shall be clearly visible from the main entrance and project a friendly, non-institutional image. Unless requested, centralized surveillance of the teen/athletic entrance and of individually supervised activity rooms is not required.

In the large centers, it may be more effective to distribute the functions of the control center to different locations in the building. For example, one solution might be to have one desk for the reception of visitors and youth center members near the main entrance; another to issue games off the main lounge or game room; and a third to issue indoor and outdoor athletic equipment and possibly survey activities in the multi-purpose room and/or outdoor activity areas.

- c. Size and Layout Variables.** Figure 5-9 shows typical layouts for the sign-in/check-out booth and games storage. Table 5-10 provides recommended sizes for these areas.

- d. Furnishings and Equipment.**

- built-in desk unit and office-type chair
- locked storage cabinet for records and valuable equipment
- public address system
- central lighting controls
- office supply cabinet
- copying machine
- typewriter
- telephones
- activities board

- e. Materials and Finishes.**

- Floors: Carpet or resilient tile.
- Walls: Painted gypsum board
- Ceiling: Acoustically absorbent

Table 5-11:
Staff Office Sizes

	Staff Office	
	ft.	m.
EYP† 250-600		
EYP† 601-1,200	100	9.3
EYP† 1,201-2,400	150	13.9
EYP† 2,401 +	200	18.6

† Eligible Youth Population

Table 5-12:
Lobby Sizes

	Lobby	
	ft.	m.
EYP† 250-600	60-75	5.5
EYP† 601-1,200	100	9.3
EYP† 1,201-2,400	150	13.9
EYP† 2,401 +	200	18.6

Coat Closet
ft. m.

EYP† 250-600		
EYP† 601-1,200	75	7
EYP† 1,201-2,400	100	9.3
EYP† 2,401 +	125	11.6

† Eligible Youth Population

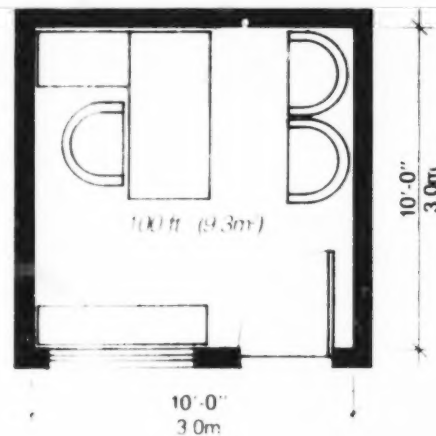
‡ Minimum Vestibule Area

2. Staff Offices

- Use. Offices for staff members need not be large since management responsibilities are limited. At most youth centers, at least two offices are needed - one for the director of the center, and a shared office with a minimum of two desks for the other staff.
- Circulation and Relationships. Staff offices shall be located in a quiet part of the building, perhaps near the structured activities area. For privacy, offices which open on to a lightly trafficked area are preferred.
- Size and Layout Variables. Figure 5-10 shows the typical layout of a staff office. The recommended number of offices according to user population are provided in Table 5-11. Each office shall measure approximately 10'-0" x 10'-0" (3.0m x 3.0m).
- Furnishings and Equipment.
 - office desks and chairs
 - telephones
 - typewriters
 - bookshelves
 - file cabinets
 - taskboards
 - wall clocks
 - desk lamps
- Materials and Finishes.
 - Floor: Carpet
 - Walls: Painted masonry or painted or vinyl covered gypsum board
 - Ceiling: Acoustically absorbent

Figure 5-10:
Staff Offices
Size and Layout

Note: Provide large windows if offices border stairs or outdoor space.



E. Support Spaces

1. Lobby

- Use. The lobby primarily serves as an orientation space, but also as a waiting room and appropriate place to display trophies, artwork, and exhibits.
- Circulation and Relationships. Visual monitoring of the lobby from the control center/reception desk is required to control access to activity and support spaces. In order to accommodate evening activities in the multi-purpose room while the rest of the building is closed, direct access from the lobby to the multi-purpose room shall be provided, via public toilets, telephone alcoves, and coat closets. Lounge space for youth to wait for friends or parents is highly recommended, and shall be adjacent to or incorporated into the lobby space.
- Size and Layout Variables. Table 5-12 provides recommended sizes for the lobby according to user population, taking into account the secondary functions the space must accommodate. If a waiting area is provided, the furniture arrangement shall be considered in the layout of the lobby. Seating plans which provide a view of the outdoor entry area are preferred.
- Furnishings and Equipment.
 - comfortable lounge furniture
 - TV (optional, but advised)
 - coffee table and side table for magazines
 - 1-3 public telephones
 - trophy cases
 - prominently placed activity board
 - display shelves, kiosks, etc.
- Materials and Finishes.
 - Floor: Floor mats by the door to clean and dry shoes, carpet or area rugs in the seating area, carpet, resilient or abrasive ceramic tile, or masonry throughout.
 - Walls: Painted masonry, painted or vinyl covered gypsum board, or painted plaster.
 - Ceiling: Acoustically absorbent.
- Special Environmental Considerations.
 - HVAC: As this area serves as a buffer zone between the out-of-doors and the artificial environment inside, double doors separated by a small entry space are recommended.
 - Illumination: During the day, natural lighting shall predominate. In the evening, the lobby shall be brightly lit to invite use and discourage intruders.

2. Storage

- a. Use. Adequate storage is vital to the efficient operation of youth centers: do not cut storage space in the name of economy. Both general and specialized types of storage are required. The storage needs of specific spaces in the building are as follows:
- Lobby: coat racks or closet
 - Game Room: general storage
 - Lounges: bookshelves
 - Project Spaces:
 - lockable storage closet for arts and crafts supplies

- wall cabinets
- cabinets under the sink for cleaning supplies
- closet or alcove for storing tables, chairs, lecterns, stands, mats etc., when not in use.
- Meeting Rooms: individual freestanding storage units
- Snack Bar:
 - lockable food storage room with shelves
 - over and under the counter cabinets
- Multi-purpose Space:
 - athletic equipment storage room (may double as storage for the equipment issue desk)
 - floor mats for gymnastics
 - costume closet (preferably behind stage)
 - alcove for storing the stage
 - tables, chairs, lecterns, stands, etc., for special events
- Sign-In/Check-Out Booth: Games and athletic equipment storage room shall be provided (if there is a separate equipment issue desk, separate storage shall be provided for athletic equipment). This storage room will be outfitted with shelves and cabinets to store board games, playing cards, videocassette players, records, ping pong balls and paddles, roller skates, basketballs, volleyballs, pool cues, badminton equipment, puppets and puppet stage, and other sundry items
- Staff Offices: optional office supply closet with clothes rod
- Halls: maintenance closet(s) with janitor's sink
- General: Cabinet or closet for seasonal decorations and props for special events, a major storage item at many centers, is required.
- Outdoors: storage shed for lawn mower, rakes, clippers, fertilizer, and for outdoor sports equipment such as goal nets, bases, trampoline, etc.

- b. Size. Table 5-13 provides recommended sizes for the different storage areas.

Table 5-13:
Storage Sizes

	Sizes for Center of EYP: 250-600	Sizes for Center of EYP: 600-1200	Sizes for Center of EYP: 1200-2400	Sizes for Center of EYP: 2400 +
	ft. ² m ²	ft. ² m ²	ft. ² m ²	ft. ² m ²
Game Room				
□ General Storage	25 2.3	50 4.6	100 9.3	100 9.3
Lobby				
□ Coat Closet	— —	25 2.3	35 3.2	50 4.6
Snack Facilities				
□ Food Storage Room	— —	25 2.3	40 3.7	50 4.6
Project Rooms				
□ Arts & Crafts Closet	10 0.9	20 1.8	2@a 20 2@a 1.8	3@a 20 3@a 1.8
Multi-Purpose Rooms				
□ Sports Equipment & Special Events Storage: within room		75 7.0	200 18.6	300 27.9
Sign-In/Check-Out Desk				
□ Games & Equipment Storage	90 8.4	55 5.1	100 9.3	100 9.3
Hall				
□ Maintenance Closet	25 2.3	25 2.3	60 5.6	60 5.6
Outdoors				
□ Storage Shed††				
Total Storage Area	150 13.9	275 25.5	575 53.4	720 66.9
% of Total Building	3.7%	4.5%	5.9%	4.9%

† Exempt Youth Population

†† The storage shed must be accessible from outdoors and may be located next to the multipurpose room. Size is dependent on the storage needs of the outdoor athletic program and grounds maintenance crew.

3. Toilet and Changing Rooms

- a. Use. The toilet and changing rooms must service the entire building and provide adjunct facilities for sports activities as well as dramatic performances. When the drama and/or sports program is active, lockers and showers are recommended, though baskets or cubbies to hold clothes and a single shower will suffice. If the toilets and changing rooms must service an on-site swimming pool, lockers and showers are required.

- b. Circulation and Relationships. Toilet rooms must be accessible from all activity areas, both indoors and out. They shall be convenient to the multi-purpose room and accessible for evening use when the rest of the building is secured. Changing rooms, equipped with lockers and showers, shall have direct access to the toilet area, or shall also be equipped with toilets and sinks. Maintenance closets containing cleaning supplies will be conveniently located. If feasible, a backstage passage connecting the changing room to the stage in the multi-purpose room is advised.

- c. Size and Layout Variables. The toilets and changing rooms will vary in size and layout depending upon the fixtures chosen. Figure 5-11 shows a typical layout for a changing room with toilets. Fixture allowances are referenced in *DOD 4270.1M*. Table 5-14 provides recommended overall square footages for restrooms and changing rooms.

In layout and choice and position of fixtures, all toilet areas and changing rooms shall comply with federal standards for accessibility to the handicapped.

- d. Furnishings and Equipment.

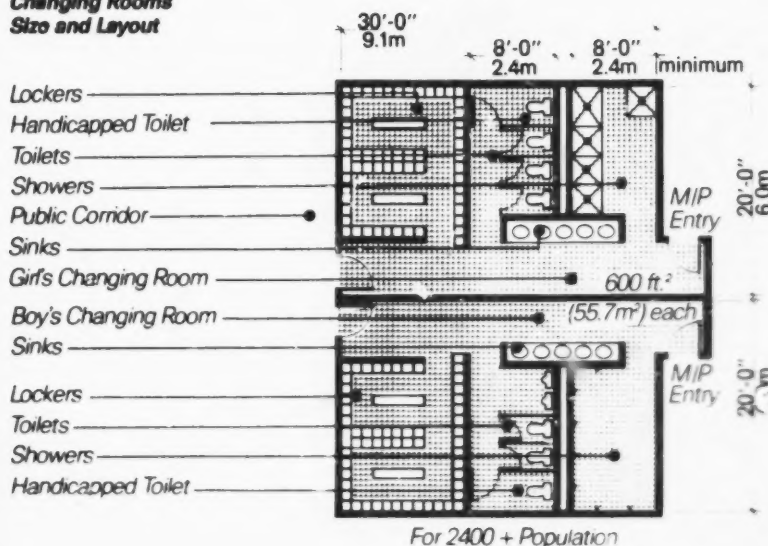
- water closets (at least one for the handicapped)
- sinks (at least one for the handicapped)
- urinals
- drinking fountain
- towel bars or hooks
- hand dryers
- mirrors above each sink
- 1 full-length mirror

- e. Materials and Finishes.

- Floor: Resilient tile in changing rooms, glazed or ceramic tile in toilet rooms.
- Wainscot: Glazed or ceramic.
- Walls: Painted masonry, gypsum board, portland cement plaster, or high strength gypsum plaster.
- Ceiling: Painted or moisture resistant gypsum board, Keene's cement plaster, portland cement plaster, or high strength gypsum plaster.

- f. Special Environmental Considerations. The floor shall be outfitted with floor drains.

Figure 5-11:
Changing Rooms
Size and Layout



4. Mechanical Rooms

- a. Use. This room houses mechanical and electrical equipment in conjunction with smaller utility closets located throughout the building.
- b. Circulation and Relationships. The mechanical room shall be located to minimize lengths of distribution services. Direct access shall be provided from this room to an exterior service entrance. All circulation associated with the mechanical services and maintenance operations shall be separate from circulation for the public.
- c. Size and Layout Variables. The size and internal layout of the mechanical room depends upon the type of equipment installed within.
- d. Materials and Finishes.
 - Floor: Concrete, or in janitor's closets, resilient.
 - Walls: Painted masonry.
 - Ceiling: Painted gypsum board.

5. Corridors and Stairways

- a. Use. The corridors and stairs provide the means for circulation of staff, participants, visitors and spectators.
- b. Circulation and Relationships. The corridors and stairs shall link the lobby to all activity, support, staff, and public spaces. If the building has a second floor, the stairs shall be conveniently located and immediately visible.
- c. Size. The width of the corridors shall be at least 8'-0" clear. The width of the stairs shall be at least 3'-8" clear. The ceiling height of the corridors shall be at least 9'-0", and at least 7'-0" clearance shall be provided for stairways.
- d. Materials and Finishes.
 - Stair treads and risers: Resilient tile.
 - Floor: Resilient tile.
 - Walls: Painted masonry, painted or vinyl-coated gypsum board, or painted plaster.
 - Ceiling: Acoustical or painted gypsum board.

Table 5-14:
Toilet & Changing Room Sizes

	Toilet Room		Changing Room	
	ft. ²	m ²	ft. ²	m ²
EYP† 250-600	100	9.3	—	—
EYP† 601-1200	130	12.0	—	—
EYP† 1201-2400	250	23.0	(Part of Toilet Room)	
EYP† 2401+	200	18.6	600	55.7

† Eligible Youth Population

F. Outdoor Spaces**1. Entry Area**

- a. Use. The entry plaza has great visibility, and should be a strong influence on the image of the building. Landscaping and paving shall be used to define the main entrance and complement the architecture.
- b. Circulation and Relationships. This space shall be visible from the street, and from inside the entry (in particular, from lounge seating in the lobby). Wheelchair-accessible paths from the vehicle drop-off area, the parking lot, the bike rack, and the bus stop feed into this space, culminating in a wide paved surface in front of the main entry. Seating provided in this area for socializing and waiting shall not inhibit the flow of pedestrian traffic.
- c. Size and Layout Variables. Paths shall be a minimum of 6'-0" wide and have a gradient of less than 5 percent. See illustrative plans for appropriately sized entry areas.
- d. Furnishings and Equipment.
 - benches and other built-in seating
 - immovable trash receptacles
 - bike racks
 - marquee or kiosk for announcements
 - light bollards or other outdoor lighting fixture to illuminate entries and pathways
- e. Materials. Surfaces: Brick, stone, concrete or bituminous paving.

2. Athletic Fields

Athletic fields will generally be pre-existent on the site, and therefore, need not be "designed". To protect against stray balls, the building shall be sited at a distance from these fields, and, if necessary, all windows and sliding glass doors facing in their direction shall be of shatterproof glazing and/or protected with landscaping, garden walls, or gratings. Direct access from the athletic fields to the equipment issue desk and changing rooms via a back door is required. Area requirements for field sport activities are provided in Table 5-15.

3. Playground

- a. Use. At least one playground for the younger children is recommended, particularly if there is an after-school program. The playground shall be in a soft, grassy area and have equipment to support a number of play activities. A small paved surface with markings for juvenile ball games such as four square and hopscotch, is optional.
- b. Circulation and Relationships. The juvenile playground shall be sheltered from the athletic fields, the game room, and other areas likely to attract the older, more aggressive children. A location near the structured activity area would allow the playground to be used, in conjunction with the arts and crafts rooms, as part of the summer camp or day care programs. In colder climates, playgrounds should be located to take advantage of the sun. The use of landscaping to create boundaries for surveillance is strongly recommended.
- c. Size and Layout Variables. The size of the juvenile playground will depend on the climate, the amount of space and money allocated for outdoor activities, and the user population. The area required for standard playground equipment are provided in Table 5-16. Playground size will depend on the type and number of activities to be provided.
- d. Equipment. Refer to Table 5-16 for a listing of play equipment.
- e. Materials.
 - Surfaces: Grassy area and hard surface area with markings for hopscotch, four square, and other juvenile ball games. Sand must be provided under each piece of playground equipment.

Table 5-15:
Area Required
for Outdoor Field Sports

	ft ²	m ²	Acres
Playground Basketball	20,000	1,858.0	..
Little League Baseball	50,625	4,703.0	..1.2
Softball 12" Slow Pitch	64,000	5,945.8	..1.5
Soccer	72,250	6,712.3	..1.7
Football - NCAA	64,000	5,945.8	..1.5
Field Hockey	64,000	5,945.8	..1.5
Lacrosse - Men's	62,250	5,782.2	..1.4
Horseshoes	1,400	130.0	..
Jumping Pits - Informal	1,200	114.5	..

4. Hard Court

- a. Use. If funding allows, a paved surface for teen-oriented games such as basketball, tetherball, and roller skating is recommended.
- b. Circulation and Relationships. The hard court shall be accessible via the "back door" and/or teen door, and be convenient to the equipment issue desk and game room. Landscaping shall be used to define and visually separate the space from areas designed for younger children.
- c. Size and Layout Variables. The hard court is intended for informal games, and, unless requested, need not be sized for regulation basketball. The area requirements for various hard court sports are provided in Table 5-17.

d. Equipment.

- backboards and basketball hoops
- tetherball
- goal nets for field hockey
- roller skating or bicycle course (optional)

e. Materials.

- Surface: Bituminous or concrete with markings for basketball and field hockey.

5. Terraces, Courtyards, Patios

- a. Use. Terraces, courtyards, and/or patios for barbecues, dances, open-air eating, outdoor performances, arts and crafts activities, and lounging are recommended for youth centers in temperate climates. These outdoor areas shall serve as extensions of indoor functions: an outdoor eating area with patio furniture or picnic benches off the snack bar; a walled patio for drying arts & crafts projects or for gardening off the project rooms; a terrace for socializing with stepped seating or built-in benches off the game room. Outdoor spaces shall be located to take advantage of a favorable exposure to the sun or available shade, depending on the climate. Landscaping elements, (such as planting, paving, low walls, seating, pergolas and arbors, fountains and sculpture), shall be used to enhance the appeal of the space, create separate areas within a larger space, and define boundaries.

Table 5-16:
Area Required
for Play Equipment

	"Play Space Unit"		Number of Users
	ft. ²	m ²	
Low Tire Swing	150	13.9 . . .	1
High Swing	250	23.2 . . .	1
Slide	450	41.8 . . .	6
Horizontal Bars	180	16.7 . . .	4
Horizontal Ladders	375	34.8 . . .	8
Traveling Rings	625	58.0 . . .	6
Giant Stride	1225	113.8 . . .	6
Balance Beam	100	9.3 . . .	4
Sand Box	300	27.9 . . .	15
Geodesic Climber	300-700 . .	27.9-65.0 . .	4-20

Table 5-17:
Area Required for
Hard Court Activities

	ft ²	m ²
Basketball Court (High School Size w/3'-0" min. clearance on all sides.)	5040	468.2
Volleyball w/clearances	4000	371.6
Tennis Courts w/clearances	7200	668.9
Tetherball (court only)	315	29.3
Outdoor Racquet or Handball (court only)	800	74.3
Hopscotch (court only)	62	5.7
Shuffleboard (court only)	315	29.3
4 Square	225	20.9

- b. Circulation and Relationships. Patios, terraces, and courtyards shall be located adjacent to the functional spaces they support, and, to the greatest extent possible, be continuous with these spaces. Where economically sound and/or energy efficient, sliding glass doors or wide expanses of glazing shall be used to provide natural illumination and bring the outdoors in. If sliding glass doors to an outdoor space are not to become a point of entry, low walls, plantings, or other landscaping devices shall be used to limit access from the outside, and to screen these areas from direct view from the street. Intermediate indoor/outdoor spaces such as screened-in porches, verandas, covered courtyards, and solariums shall also be considered.
- c. Size and Layout Variables. The size of each paved outdoor space will depend on their number and intended function, and will vary greatly from building to building.
- d. Furnishings and Equipment.
 - seating appropriate to the intended function of the space (patio furniture with umbrellas, picnic benches, stepped seating, built-in tables and chairs, etc.)
 - trash receptacles
 - landscape elements (plantings, fountains, sculpture, low walls, arbors, pergolas, etc.)
- e. Materials.
 - Surfaces: Various types (e.g., brick, clay tile, wood decking, concrete slabs, stone aggregate pavers, etc.). A smooth surface is required for roller skating.
- f. Special Environmental Considerations.
 - Illumination - Atmospheric outdoor lighting for evening dances is recommended.
 - Drainage - Hose bibbs, etc.

6. Parking and Service Areas

- a. Use. Parking spaces for staff, older teens, and guests, and, bike racks for younger children shall be provided. Servicing, deliveries, garbage pick-up, and mechanical equipment access require a separate service entrance away from public traffic. A vehicular drop-off by the main entrance is also advised.
- b. Circulation and Relationships. Pedestrian, vehicular, and bicycle traffic shall be separated to the maximum extent possible. Parking lots shall be located not more than 300'-0" away and preferably within sight of the main entry (with the exception of overflow parking for special events). Spaces for the vehicles of handicapped drivers and curb cuts at walkways shall be provided in compliance with federal regulations. Service vehicles will use the public parking access road, but shall have a separate building entrance and parking lot screened from public view with plantings and/or walls. Bike racks shall be located such that bicycle traffic will not interfere with pedestrian or vehicular traffic.
- c. Size. The recommended number of parking spaces and overall size of the parking lot are provided in Table 5-18 for different sized youth centers. The service access must be at least 10'-0" wide, and allow enough turn-around room at the end to accommodate garbage trucks, and other over-sized service vehicles.
- d. Equipment.
 - bike racks
 - street lights for the parking lot and vehicle drop-off area
- e. Materials.
 - Surfaces: Bituminous paving.

Table 5-18:
Parking Lot Sizes

	Number of Parking Spaces [†]	Parking Lot Area ^{††}	
		ft ²	m ²
EYP* 250-600	10	4,000 . . .	371.6
EYP* 601-1200	15	6,000 . . .	557.4
EYP* 1201-2400	23	9,200 . . .	854.7
EYP* 2401 +	37	14,800 . .	1374.9
*Eligible Youth Population	†Based on 1 parking space for 500 ft ² (46 m ²) of building area. ††Based on 400 ft ² (37.1 m ²) per parking space.		

A. Development of Design

Once the nature of the individual spaces is determined, and the criteria for construction established, the overall design of the building can be considered. Factors which determine the success of a particular design include:

1. Value and Cost

The design shall result in a complete facility that can be constructed within the project funds and maintained economically.

2. Consideration of Environment

The design shall maximize the advantages and minimize the disadvantages of the environmental conditions of the base.

3. Operating Efficiency

The individual spaces shall be efficiently and effectively arranged to meet the specific needs of the user population, and, allow for anticipated future expansion.

B. Project Cost

The design shall be guided by considerations that reduce project cost. The following basic decisions shall be part of the design where they result in savings in total construction and operating costs, and where they are permitted by other project requirements.

1. Floor Area

If possible, reduce the floor area below the allowable limit by using a compact plan that minimizes floor area for corridors, walls and structure, and, by incorporating multi-purpose spaces that will efficiently allow two or more activities to share a space at the same time.

2. Building Massing

Structural, architectural and mechanical costs can be reduced with a compact building volume. Generally, spaces not requiring constant surveillance, i.e., the teen lounge, meeting rooms, music rooms, and administrative offices, can function satisfactorily on a different level than the social and public spaces. As the multi-purpose room requires a 2-story ceiling height, these second floor spaces might form a mezzanine level overlooking this space, possibly outfitted with spectator seating.

3. Simplified Construction

The following means to simplify construction are encouraged where they are feasible:

- a. Use pre-engineered building systems where they are locally available and where they can be supplied and maintained economically.
- b. Use familiar building assemblies and forms that do not require a specially qualified labor force or special construction equipment for installation.
- c. Locate those spaces that require similar mechanical services in one area to limit piping and duct runs.
- d. Use simple rugged materials that have a low life-cycle cost.
- e. Minimize the number of different materials used and select local products when practical.

4. Energy Management

Operating costs can be reduced by applying solar design principles, maximizing the effective use of insulation, using fuels that are economical and reliable over the life of the facility, and selecting energy efficient mechanical and electrical systems. Computer analysis shall be used to determine the most efficient operation of mechanical, electrical, and architectural systems.

Table 6-1:
Environmental Considerations

	Maximize direct solar gain and minimize heat losses ▼	Balance solar heat gain on a seasonal basis ▼	Reduce direct solar and conductive heat gains ▼	Minimize solar sky and ground reflectance ▼	Moderate temp extremes (daily and/or seasonal fluctuations) ▼	Reduce cold air infiltration (protect against prevailing winds) ▼	Use air movement to promote evaporative cooling ▼	Promote natural convective loops ▼
Optimize ratio of exterior wall surfaces to interior floor space	C		H		HC			
Orient the building along the east-west axis	C	T	HW		H		W	W
Openings facing the afternoon sun.	C		HW		H			
Provide shading at openings.		T	HW	C	H			
Place low use spaces adjacent the: • West-facing exterior wall			H	W	H			
• Prevailing winter wind-facing wall.	C	T				CT		
Consider berming earth against building perimeter wall.	C		HW		H	CT		
Locate windows for cross ventilation during warmest months.							THW	
Provide ground cover & minimize paved surfaces adjacent to building				THW				W
Use low conductive materials for the building envelope.	C		W					
Use light reflective finishes & colors on roof & exterior walls.			HW					
Use dark finishes & colors for the roof & exterior walls.	C							
Consider shaded, landscaped courtyards & garden entrances.			HW				H	
Use concrete or masonry materials for: • Interior surfaces exposed to sunlight. • Exterior wall construction.	C		H		H			
Provide on site: • Heavy vegetation • Water features (reflecting pools)			W		H		H	
	▲	▲	▲	▲	▲	▲	▲	▲

H = Hot-Dry

W = Warm-Humid

C = Cold

T = Temperate

C. Environmental Influences

1. Adaptation for Climate

The design shall be suited for the specific climate of the base. Table 6-1 describes the design devices generally preferred for various environmental conditions. These devices, or equivalent elements or arrangements appropriate for the specific climate and site, shall be provided where they result in project cost savings.

- a. Hot-Dry Climates. Locations where the dry bulb temperature is at least 93°F for 155 or more hours during the 6 warmest months of the year, and where the annual amount of rainfall is 10 inches (3.94 cm) or less are defined as hot-dry climates.
- b. Warm-Humid Climates. Locations where the wet bulb temperature is at least 67°F for 800 hours or more during the 6 warmest months of the year are defined as warm-humid climates.
- c. Temperate Climates. Locations where the dry bulb temperature is at least 80°F for 350 hours or more during the 6 warmest months of the year are defined as temperate climates.
- d. Cold Climates. Locations where the dry bulb temperature is at least 80°F for less than 350 hours during the 6 warmest months of the year are defined as cold climates.

2. Ratio of Indoor to Outdoor Space

The climate will influence the area allocated for indoor versus outdoor activities. Other determining factors - such as existing on-site facilities (swimming pools, tennis courts, athletic fields, etc.), the unpredictable effects of topography, and limitations on the size of the site - make the ratio of indoor to outdoor space a difficult one to calculate. In any case, when weather conditions permit, outdoor areas such as courtyards, patios, terraces, playgrounds, hard courts, and playing fields shall be expanded relative to the size of the interior spaces; or, vice versa, if the opposing condition exists.

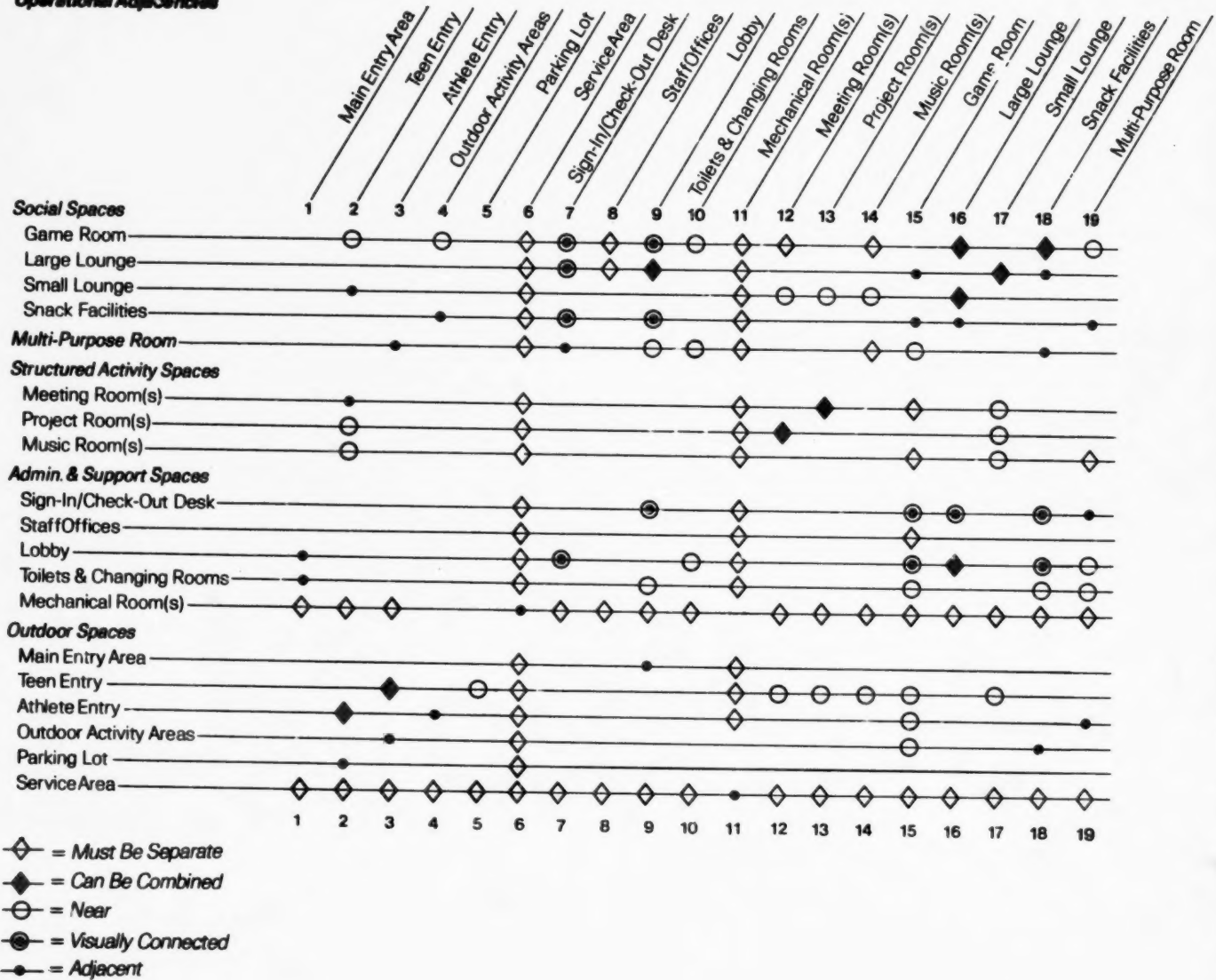
D. Relationship of Spaces

Tables 6-2 through 6-4 describe the generally preferred functional relationships of the component spaces. Specific project requirements may suggest a different functional organization.

1. Operational Adjacencies

To maximize the efficient and effective operation of the facility, the spaces shall be arranged to result in the proximities indicated in Table 6-2. These adjacencies are derived from zoning issues discussed in Chapter 3, "Design Objectives."

Table 6-2:
Operational Adjacencies



2. Access Controls

To provide efficient but secure user circulation in the facility, the spaces shall be arranged for accessibility and supervision according to Table 6-3.

3. Expansion Potential

In anticipation of future changes in youth center programs requiring enlarged or additional activity or support areas, the spaces shall be arranged to facilitate possible expansions as indicated in Table 6-4.

Table 6-3:
Access Controls

T = Teens

J = Juveniles

S = Staff Only

V = Visitors

1 = Required from Central Desk

2 = Required from within Space

3 = Optional

M = Main Entry

T = Teen Entry

A = Athletic Entry

S = Service Entry

	User Access	Visual Monitoring	Probable Entry Point
Social Spaces			
Game Room	TJSV	1	MT
Large Lounge	TJSV	1	MT
Small Lounge	TJSV		T
Snack Facilities	TJSV	1	MT
Multi-Purpose Room	TJSV	1	MTA
Structured Activity Spaces			
Meeting Room(s)	TSV	2	MT
Project Room(s)	TJSV	2	MT
Music Room(s)	TJSV	2	MT
Admin. & Support Spaces			
Sign-In/Check-Out Desk	S		M
Staff Offices	S		M
Lobby	TJSV	1	M
Toilets & Changing Rooms	TJSV		M
Mechanical Room(s)	S		S
Outdoor Spaces			
Main Entry Area	TJSV	1	
Teen Entry	TSV	3	
Athlete Entry	TJSV	3	
Outdoor Activity Areas	TJSV	2	TA
Parking Lot	TJSV	3	MT
Service Area	S	3	S

Table 6-4:
Expansion Potential

1 = Highly Likely

2 = Possible

R = Required

O = Optional

Expendability	1	2		2	2	2	2	2	2	2	2	2	2	2	2
Outdoor Activity Areas															
Multi-Purpose Room															
Service Area															
Sign-In/Check-Out Desk															
Staff Offices															
Lobby															
Toilets & Changing Rooms															
Mechanical Room(s)															
Meeting Room(s)															
Project Room(s)															
Music Room(s)															
Game Room															
Large Lounge															
Small Lounge															
Snack Facilities															
	O	R		R		R	R	O	R	R	O	O			

Built-in Flexibility

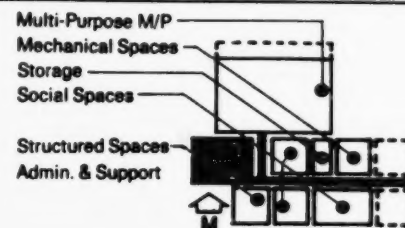
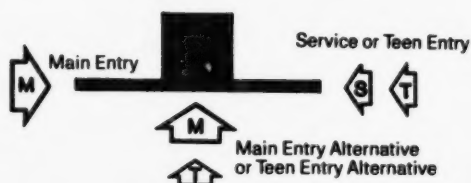
E. Organization Principles

The design shall take form from an architectural concept which organizes the components of the project into a coherent whole.

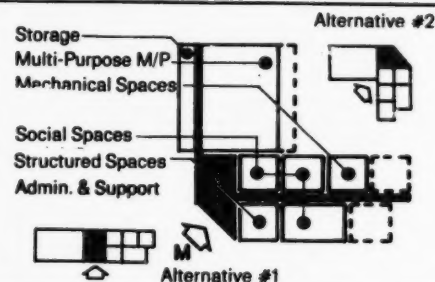
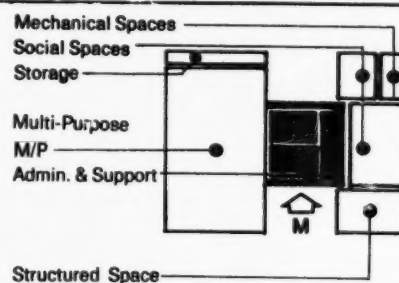
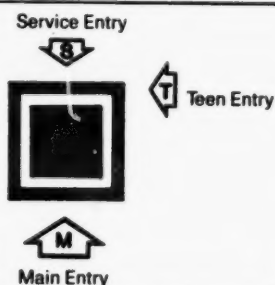
Figure 6-1 describes sample concepts based on organization principles which meet the objectives for the design of youth centers.

Access & Control**Zoning & Expansion****Lineal Support Spine Scheme**

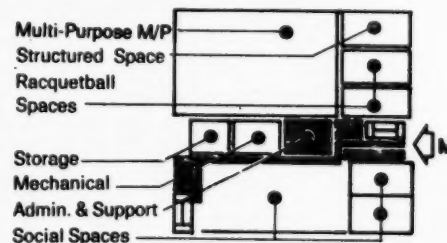
Note: See Figure 6-2 for Illustrative Plan

**Centralized Support Core Scheme**

Note: See Figure 6-2 for Illustrative Plan

**Centralized Support Core With Ring Circulation****Two-Story Scheme For Large Facilities**

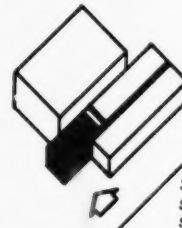
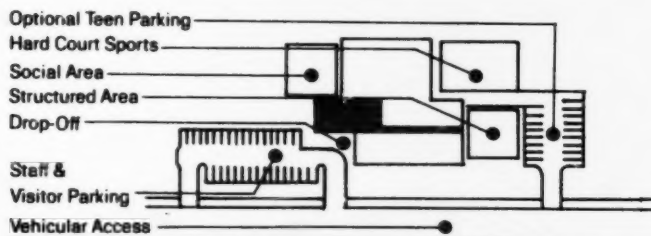
Note: See Figure 6-4 for Illustrative Plan



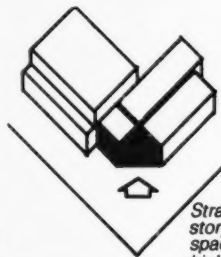
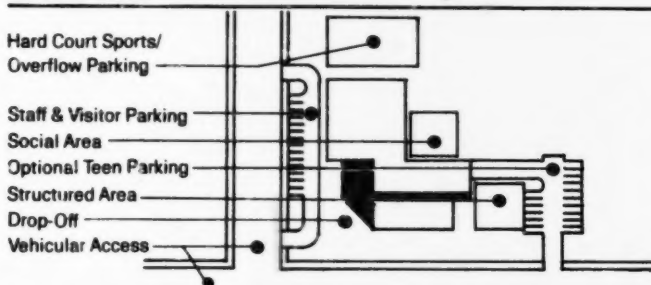
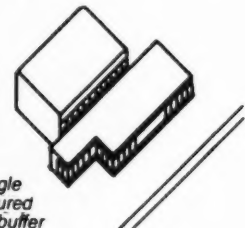
The specific project requirements will vary from building to building, and thus, additional conceptual analysis by the designer is advised.

Site

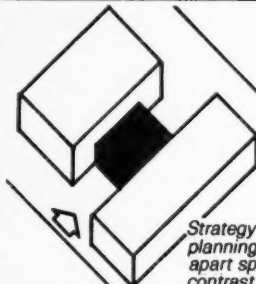
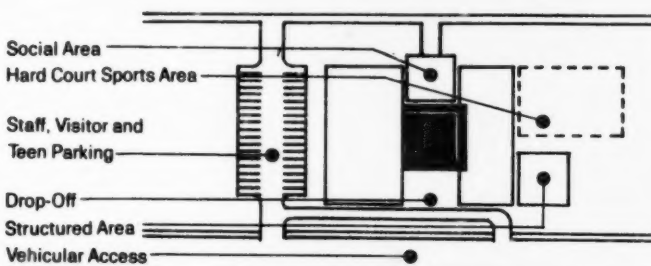
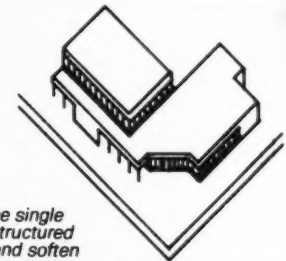
Volumetric Expression



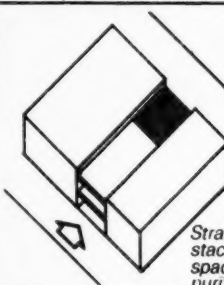
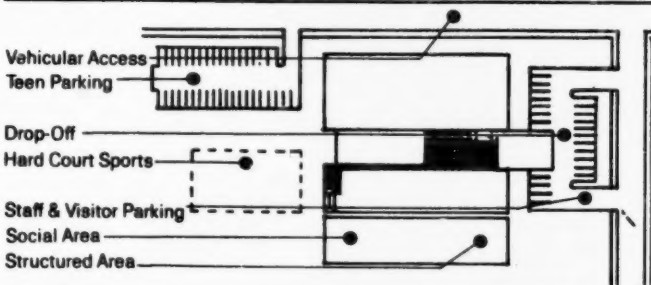
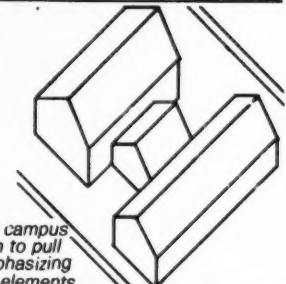
Strategy #1 — Use single story social and structured spaces to surround or buffer high multi-purpose space.



Strategy #1 — Use single story social and structured spaces to buffer and soften high multi-purpose space.



Strategy #2 — Use campus planning approach to pull apart spaces, emphasizing contrast between elements.



Strategy #3 — Use two-story stacking of social and structured spaces to balance high multi-purpose space.

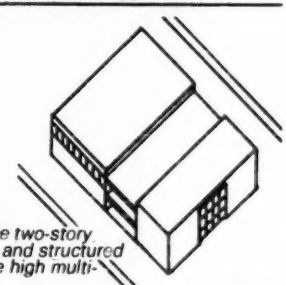


Table 6-5:
Space Program and
Occupancy Estimates

	Area per Person		Number of Users	Size of Spaces	
	ft. ²	m ²		ft. ²	m ²
Game Room			20	800	74.3
□ Storage				75	7.0
Large Lounge	40	3.7		450	41.8
Small Lounge	15	1.4		150	13.9
Snack Bar			1	150	13.9
□ Seating	15	1.4	13	200	18.6
□ Vending				40	3.7
□ Food Storage				100	9.3
Multi-Purpose Room			50†	5400	501.7
□ Storage				200	18.6
Meeting Rooms††	20	1.8		—	—
Project Rooms	20	1.8	41	2@300	2@27.9
□ Closet Storage				2@20	2@1.8
Music Rooms			4	2@65	2@6.0
Sign-In/Check-Out Desk			2	100	9.3
Games & Equipment Storage				100	9.3
Staff Offices			3	2@100	2@9.3
Toilet Rooms			585	2@250	2@23.3
Net Area				9235	857.9
Lobby	15	1.4	10	150	13.9
□ Coat Closet			585	35	3.2
Walls and Structure				960	89.2
Corridors and Stairs				960	89.2
Gross Area				11,340	1053.5
Maintenance and Mechanical				800	74.3
Outdoor Equipment Storage				125	11.6
Total Occupancy	185	17.2	400		

† Provide seating
for 400
spectators.

†† One of the
Project Rooms
may be used as
a Meeting Room.

F. Illustrative Design Schemes

Each project requires a unique design tailored to the local character of the base, the site, and the needs of the user population. The following schemes are illustrations of design concepts based on the assumed conditions and requirements of a fictitious base. They are not intended as predetermined solutions, but are offered for guidance only.

1. Scheme A

Figure 6-2 shows an example of a medium sized youth center. The facility is 11,340 ft.² and services approximately 800 youths. Frequent requests for a clubhouse suggest that teen activities, particularly evening social events such as dances and indoor roller skating, will be popular. Table 6-5 provides a program of spaces and occupancy estimates.

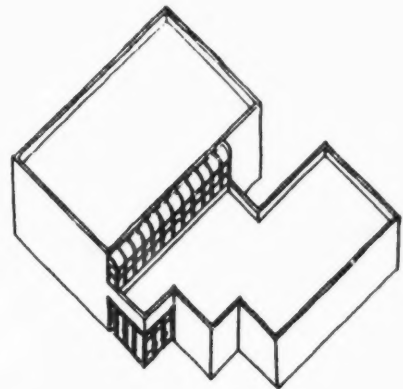
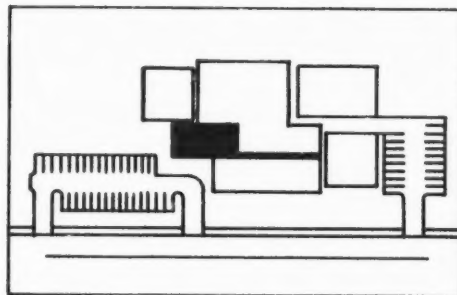
The base is located in the southeast United States near the ocean. The site has gently rolling hills with athletic fields in the northeast corner and a secondary road running east-west across the southern border. The climate in this area is very humid and warm for most of the year. Air conditioning is required for the summer months, though sun shading and provisions for natural ventilation shall also be considered. The winter season is very mild requiring a small number of heating degree days.

In Scheme A, a breezeway/lounge area serves as both transition space and social center, connecting the main entry and patio area and separating the multi-purpose room from the game room and structured activity areas. In the spring and fall the doors to the outdoor patio may be opened to provide natural ventilation for the building.

This area also acts as an anteroom to activities in the multi-purpose room: a place to lace up roller skates, set out food for a dance, congregate for intermission during a performance, view athletic activities etc.. In this scheme, evening activities in the multi-purpose room need not interfere with the game room and structured activities area.

The staff offices and sign-in desk are centrally located between the game room, seating and breezeway/lounge to provide overall building surveillance.

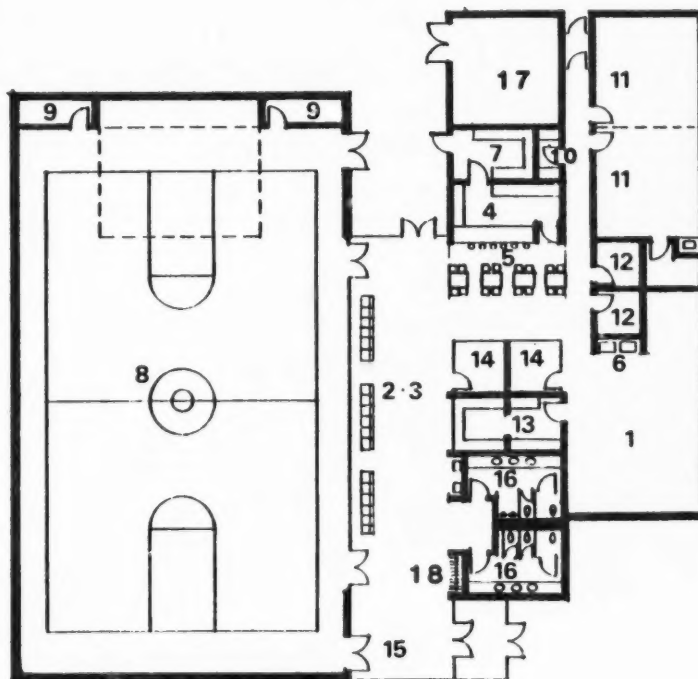
Figure 6-2:
Illustrative Design Scheme A
Youth Center—11,340ft.²



0 5 10 20 30 40 50
 Feet

0 5 10 15
 Meters

1. Game Room and Storage
2. Large Lounge
3. Small Lounge
4. Snack Facilities: Kitchen
5. Seating
6. Vending
7. Storage
8. Multi-Purpose Room
9. Storage
10. Maintenance Room
11. Meeting Rooms
Project Rooms
Closet Storage
12. Music Rooms
13. Sign-in, Check-out
Issue Games and
Equipment Storage
14. Staff Offices
15. Lobby
16. Toilets
17. Mechanical Room
18. Coat Closet



2. Scheme B

Figure 6-3 shows an example of a medium sized youth center. The center is 11,340 ft.² and will serve a centralized recreational function for 800 youths. Table 6-5 provides a program of spaces and occupancy estimates.

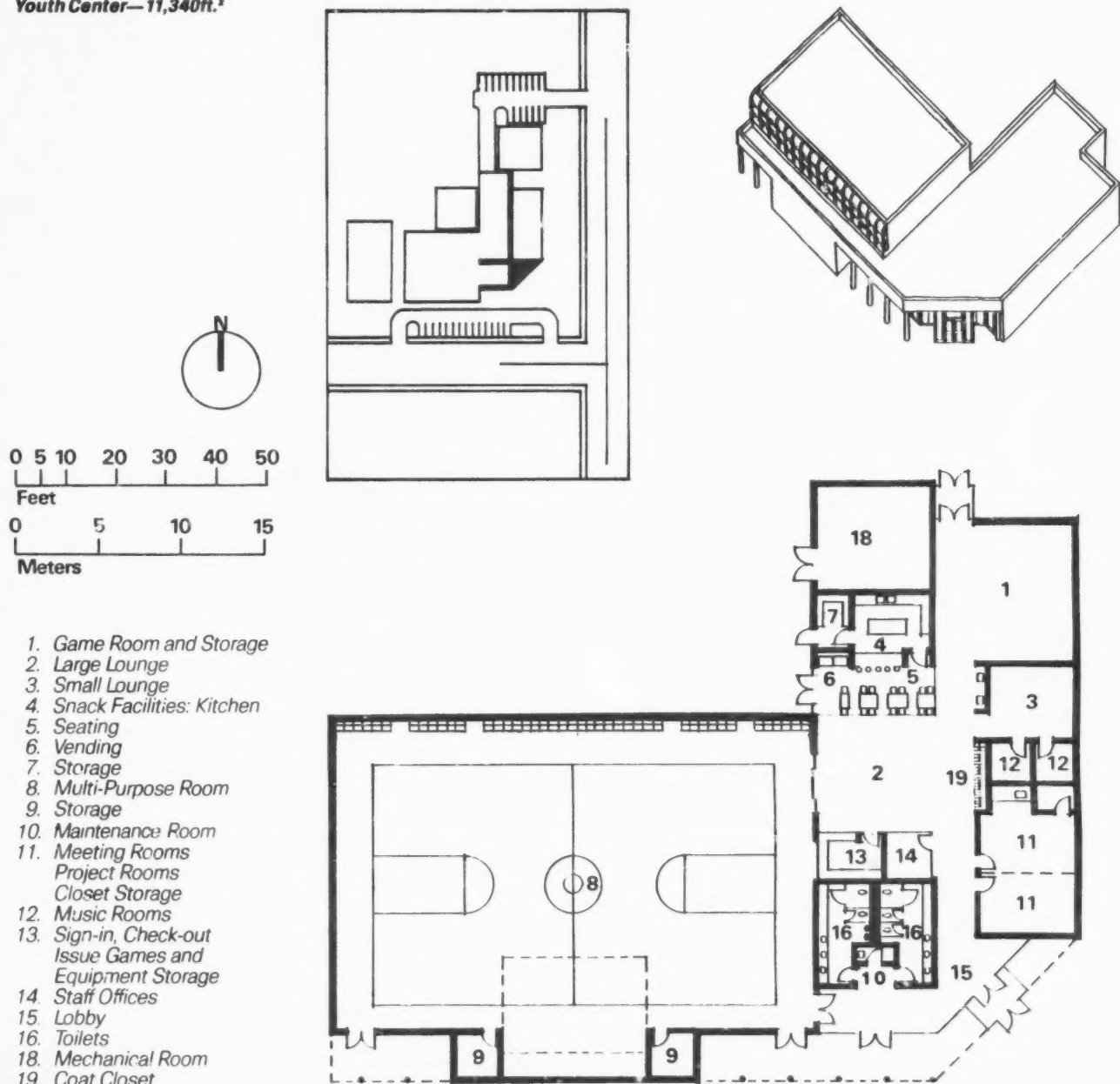
The base is located in a rural area in the mid-western United States. The site is defined by a main road on the southern border, a secondary road servicing base housing on the eastern border, and a densely wooded area to the north. Existing local features include athletic fields in the southwest corner and an offsite playground and picnic area in the southeast corner.

The climate is temperate, with four distinct seasons. The midwestern location makes the site subject to violent summer storms coming generally from the west.

The multi-purpose room will be heavily used by the community for special events and requires a separate entrance from the parking lot and adjoining patio. Lockers and changing rooms have not been included as the athletic program at local schools fulfills this need. The adjacent patio to the north is the site of barbecues and carnivals and should have access to the pantry and food preparation area of the center. An outdoor shelter to protect youth from the rain while waiting for rides is also requested.

Separate entrances into the multi-purpose room have been provided through a colonnade on the southern side of the building. There is a main corner entrance for daily use, and an athletic/special events entrance opposite the public restrooms. The colonnade provides shelter from frequent rains.

Figure 6-3:
Illustrative Design Scheme B
Youth Center—11,340ft.²



3. Scheme C

Figure 6-4 shows an example of a large sized youth center. The project is to provide service for a youth population of 2400, within 18,500 ft.². The base is located in the northernmost reaches of the United States. Because of its remote location and severe climate, the facility must meet the complete recreational needs of its youth population indoors. Sports facilities for youth are not readily available on base or in the surrounding community, therefore the center must provide for an indoor sports program. The climate here is cold and dry. Winter days are very short, and summer days are longer. The prevailing winds are from the north in the winter and from the southwest in the summer.

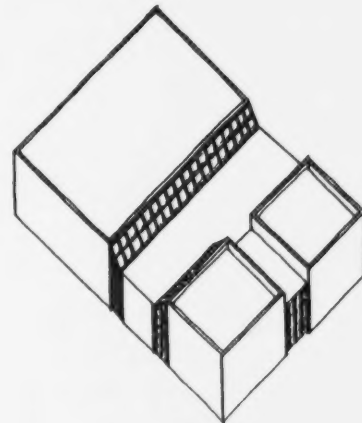
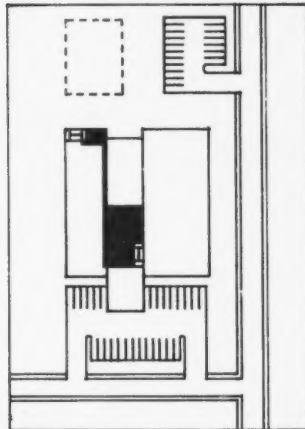
As a result of prior base planning, a smaller "confined" site among existing buildings was selected. This centrally located site was seen as more accessible to the community as a whole in lieu of the traditional residential siting normally chosen for youth centers.

The site is flat and bordered by primary and secondary roadways, to the south and north respectively.

The facility must accommodate a rigorous indoor sports program including organized basketball, gymnastics, wrestling and racquet sport leagues. Seating for 250 spectators is included in the multi-purpose room. The facility is also intended as a meeting hall for the base families.



Figure 6-4:
Illustrative Design Scheme C
Youth Center—18,500ft.²



SECOND FLOOR

1. Game Room and Storage
2. Large Lounge
3. Small Lounge
4. Snack Facilities: Kitchen
5. Seating
6. Vending
7. Storage
8. Multi-Purpose Room
9. Storage
10. Racquetball Courts
11. Meeting Rooms
Project Rooms
Closet Storage
12. Music Rooms
13. Sign-in/Check-out
Games and
Equipment Storage
14. Staff Offices
15. Lobby
16. Toilets
17. Changing Rooms
18. Mechanical Room
19. Coat Closet
20. Maintenance Room
21. General Storage
22. Bleachers



1.1

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Table 6-6:
Space Program and
Occupancy Estimates for
Youth Center of EYP 2400 +

	Area per Person		Number of Users	Size of Spaces	
	ft. ²	m ²		ft. ²	m ²
Game Room			20	1400	130.0
□ Storage				100	9.3
Large Lounge	15	1.4	60	850	79.0
Small Lounge	15	1.4		150	13.9
Snack Bar				225	20.9
□ Seating	15	1.4	13	300	27.9
□ Vending				50	4.6
□ Food Storage				125	11.6
Multi-Purpose Room			50†	7000	650.3
□ Storage				300	27.9
Meeting Rooms	20	1.8		300	27.9
Project Rooms	20	1.8	60	2@450	2@41.8
□ Closet Storage				2@20	2@1.8
Music Rooms	2 per room		6	3@65	3@6.0
Sign-In/Check-Out Desk			2	150	13.9
Games & Equipment Storage				150	13.9
Staff Offices			3	3@100	3@9.3
Toilet Rooms			600	2@200	2@18.6
Changing Rooms				2@600	2@55.7
Racquetball Courts	4 per court		8	2@800	2@74.3
Net Area				15,735	1461.8
Lobby	15	1.4	13	200	18.6
□ Coat Closet			600	45	4.2
Walls and Structure				1260	117.0
Corridors and Stairs				1260	117.0
Gross Area				18,500	1718.6
Maintenance and Mechanical				1200	111.5
Outdoor Equipment Storage				200	18.6
Total Occupancy	260	24.1	600		

†Provide seating for 500 spectators.

Table 6-6 provides a program of spaces and occupancy estimates. To accommodate all program space requirements on the small site, and respond to adverse weather, a compact two story building mass was designed.

To make the building more livable during long winter months, views are focused inward, across interior spaces. The second-story lounge overlooks the first floor, multi-purpose space and racquet courts.

The two story "program" wing of the building is designed with the educational spaces occupying the upper floor and the loud recreational spaces occupying the ground floor. An elevator and open stairway adjacent to the lobby provide vertical access between floors.

Table 7-1:
Site Standards

	<i>Technical Documents</i>
1. General	
a. Clearances, Restrictions & Setbacks	AFM 86-8 & AFM 88-15, Ch. 13
b. Fire Separations Required	AFM 88-15, Ch. 13
2. Climate and Topography	
a. Meteorological Data	AFM 88-29
b. Grading, Drainage & Erosion Controls	AFM 88-15, Ch. 15 & 18
3. Utilities	
a. Water, Gas, Electrical & Heating Supply	AFM 88-15, Ch. 1, 7, 8, 10 & 12
b. Telephone & Other Communication Systems	AFM 88-15, Ch. 7
c. Sanitary & Storm Sewers	AFM 88-11, Vol. I & AFM 88-15, Ch. II
4. Landscaping	
a. Sprinkler or Irrigation Systems	AFM 88-15, Ch. 18
b. Ground Cover & Planting	AFM 86-6, AFM 86-9, AFM 88-15, Ch. 18 & AFM 88-17, Ch. 1, 2, 3 & 4
5. Site Accessories	
a. Exterior Lighting (Street, Flood & Security)	AFM 88-15, Ch. 8
b. Signage	AFM 88-40
c. Fencing & Walls	AFM 88-15, Ch. 3
d. Pedestrian & Vehicular Circulation	AFM 88-6, Ch. 2 & 3 & AFM 88-15, Ch. 15

Table 7-2:
**Architectural and
Structural Standards**

1. General	
a. Handicapped Accessibility Design Features	AFM 88-4, Ch. 8 & ANSI A117.1
b. Seismic Zone, Wind & Snow Load Design Criteria	AFM 88-3, Ch. 1 & 3
2. Structural	
a. Design Loads	AFM 88-3, Ch. 1 & 3
b. Foundation Systems & Their Design	AFM 88-3, Ch. 1 & 3
c. Structural Elements	AFM 88-15, Ch. 3
d. Special Conditions	AFM 88-15, Ch. 3
3. Architectural	
a. U Values & Vapor Barriers	AFM 88-15, Ch. 3
b. Sound Attenuation Requirements	AFM 88-15, Ch. 3
c. Special Finishes & Material Standards	AFM 88-15, Ch. 3
d. Special Building Elements & Criteria †	AFM 88-15, Ch. 3
e. Construction Systems & Materials	AFM 88-15, Ch. 3 & AFP 88-41
f. Signage	AFP 88-40

†For roofing, loading docks, etc.

ANSI-American National Standards Institute

Table 7-3:
Fire Protection Standards

	<i>Technical Documents</i>
1. General	
a. Classification of Occupancy & Hazards of Contents	NFPA 101, Ch. 4
b. Type of Building Construction	AFM 88-15, Ch. 2 & 13
c. Fire Area Limitations	UBC, Ch. 5
d. Fire Protection Features†	AFM 88-15, Ch. 13 & NFPA 101, Ch. 6
2. Exit Requirements	
a. Types & Identification of Exits	NFPA 101, Ch. 5
b. Capacity, Number & Arrangements of Exits	NFPA 101, Ch. 5
c. Emergency Lighting & Power Sources	AFM 88-15, Ch. 13
3. Fire Protection Systems	NFPA 101, Ch. 5 & AFM 88-15, Ch. 13

4. Interior Finishes

- a. Flame Spread & Smoke Development Ratings AFM 88-15, Ch. 13
- b. Carpet & Rug Flammable Standards AFM 88-15, Ch. 13

5. Utilities & Building Services

- a. Electrical Wiring NFPA 70
- b. Air Conditioning, Heating & Ventilation NFPA 90 A & B
- c. Gas & Related Gas Piping NFPA 54
- d. Storage of Oxidizing Materials & Chlorine for Pools .. NFPA 43 A & 43 C

†Fire Walls, Fire Partitions & Smoke Barriers

Table 7-4:**Mechanical Standards****1. Plumbing**

- a. Water Supply AFM 88-15, Ch. 10
- b. Piping and Fixtures AFM 88-8, Ch. 4 & AFM 88-15, Ch. 4

2. Heating

- a. General Policies AFM 88-15, Ch. 5
- b. Equipment Standards AFM 88-15, Ch. 5
- c. Temperature & Controls ASHRAE Guide, ASME Code, NFPA 31, 54, 58, 86 A & 409

- 3. Ventilation, Air-Conditioning & Evap. Cooling AFM 88-15, Ch. 6, ASHRAE Guide, ASME Code

Table 7-5:**Electrical Standards**

- 1. Power† AFM 88-15, Ch. 7 & NEC

2. Electrical Features & Equipment

- a. Interior & Exterior Lighting†† AFM 88-15, Ch. 7 & IES Handbook
- b. Outlets, Receptacles, Switches & Grounds AFM 88-15, Ch. 7 & NEC
- c. Emergency Lighting NFPA 101, Ch. 5
- d. Telephones & Other Communication Systems AFM 88-15, Ch. 7

†Service, Distribution Systems & Standby Requirements

††Types & Intensities

Table 7-6:**Environmental Standards**

- 1. Quality Standards & Criteria† AFM 88-15, Ch. 11 & AFR 19-1
 - 2. Disposal Methods†† AFM 88-11, Ch. 5 & AFM 88-15, Ch. 11
- †Air, Noise & Waste
 ††Waste Water & Solid Waste
- ASHRAE-American Society of Heating, Refrigerating, & Air Conditioning Engineers
 ASME-American Soc. of Mechanical Engineers
 NEC-National Electrical Code of the NFPA
 NFPA-National Fire Protection Association
 IES-Illuminating Engineering Society

BY ORDER OF THE SECRETARY OF THE AIR FORCE

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